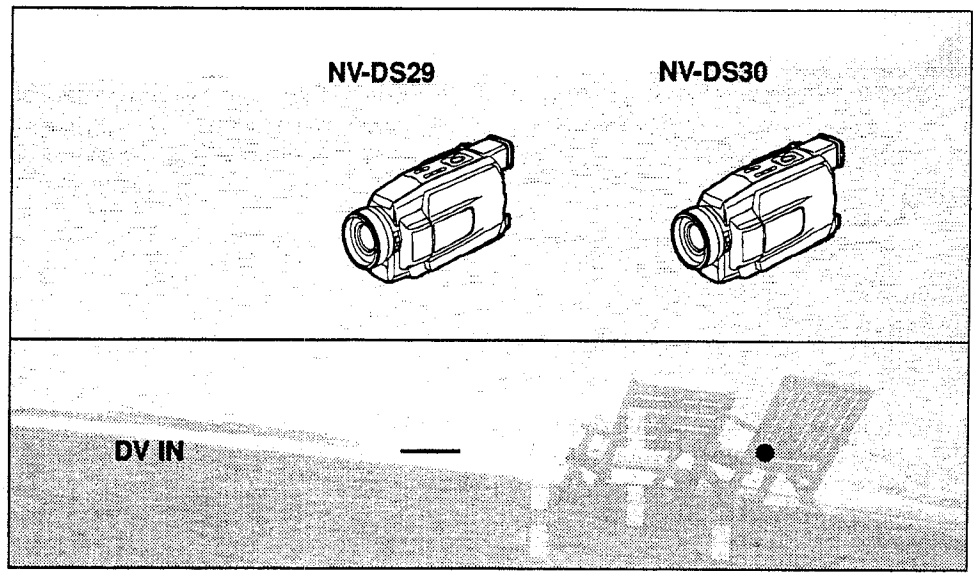
Panasonic

Digital Video Camera

Model No.
NV-DS29
NV-DS30

Operating Instructions



Before use, please read these instructions completely.

Mini DV PAL

MultiMediaCard™

VQT9687

Before Use

Information for Your Safety

Movie Camera

- **The rating plate is on the underside of the Movie Camera.**

AC Adaptor

- **The rating plate is on the underside of the AC Adaptor.**
- **As this equipment gets hot during use, operate it in a well-ventilated place; do not install this equipment in a confined space such as a bookcase or similar unit.**

To reduce the risk of fire, electric shock or product damage, do not expose this equipment to rain, moisture, dripping or splashing and ensure that no objects filled with liquids, such as vases, shall be placed on the equipment.

■Carefully read the Operating Instructions and use the Movie Camera correctly.

- **Injury or material damage resulting from any kind of use that is not in accordance with the operating procedures explained in these Operating Instructions are the sole responsibility of the user.**

Operating Instructions

- These Operating Instructions apply to models NV-DS29 and NV-DS30.
- The illustrations used in these Operating Instructions show model NV-DS30, however, parts of the explanation refer to different models.
- Depending on the model, some functions are not available.

Try out the Movie Camera.

Be sure to try out the Movie Camera before recording your first important event and check that it records properly and functions correctly.

The manufacturer is not liable for loss of recorded contents.

The manufacturer shall in no event be liable for the loss of recordings due to malfunction or defect of this Movie Camera, its accessories or cassettes.

Carefully observe copyright laws.

Recording of pre-recorded tapes or discs or other published or broadcast material for purposes other than your own private use may infringe copyright laws. Even for the purpose of private use, recording of certain material may be restricted.

- All other company and product names in the operating instructions are trademarks or registered trademarks of their respective corporations.

Pages for reference

Pages for reference are indicated with an arrow, for example:
(➡ 00)

■WARNING

To reduce the risk of fire or shock hazard and annoying interference, use only the recommended accessories and do not expose this equipment to rain or moisture.
Do not remove the cover (or back); there are no user serviceable parts inside.
Refer servicing to qualified service personnel.
Use only the recommended accessories.

■EMC Electric and magnetic compatibility

This symbol (CE) is located on the rating plate.

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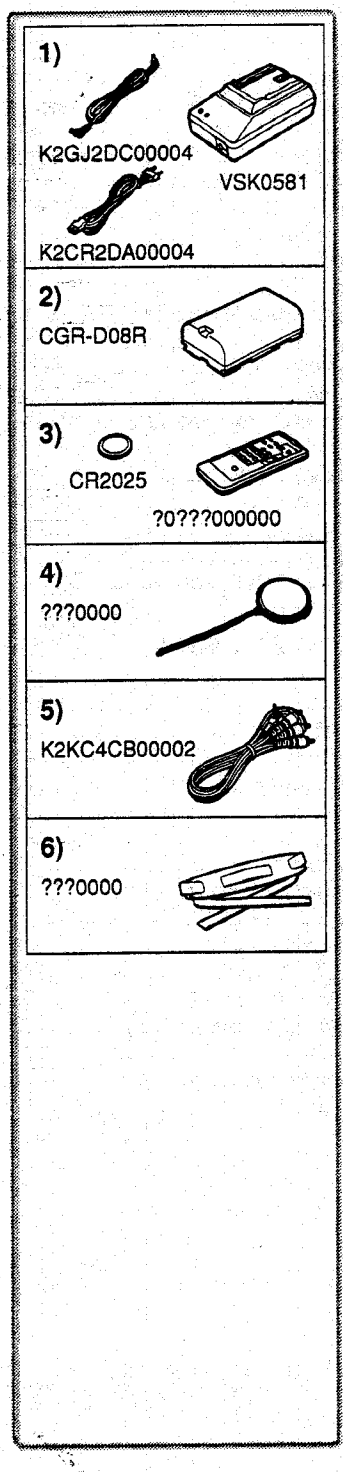


Standard Accessories

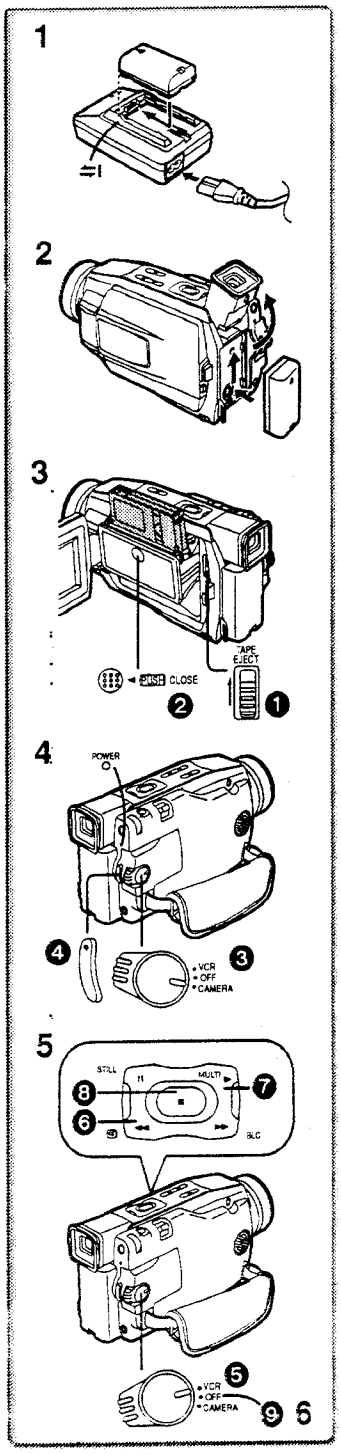
Illustrated on the left are accessories supplied with the Movie Camera.

1) **AC Adaptor, DC Input Lead and AC Mains Lead (➔ 10)**
2) **Battery Pack (➔ 10)**
3) **Remote Controller and Button-Type Battery (➔ 8, 9)**
4) **Lens Cap (➔ 11)**
5) **AV Cable (➔ 35, 36)**
6) **Shoulder Strap (➔ 12)**

Optional Accessories

1) AC Adaptor (VW-AD9E)
2) Battery Pack (Lithium/CGR-D08S/CGR-D120/800mAh)
3) Battery Pack (Lithium/CGP-D14S/CGP-D210/1400mAh)
4) Battery Pack (Lithium/CGR-D16S/CGR-D220/1600mAh)
5) Battery Pack (Lithium/CGP-D28S/CGP-D320/2800mAh)
6) Battery Pack (Lithium/CGR-D53S/CGR-D815/5300mAh)
7) Car Battery Charger (VW-KBD2E)
8) Filter Kit (VW-LF43WE)
9) Wide Conversion Lens (VW-LW4307ME)
10) Tele Conversion Lens (VW-LT4314ME)
11) Stereo Microphone (VW-VMS2E)
12) Shoe Adaptor (VW-SK11E)
13) Tripod (VZ-CT55E)
14) Personal Computer Connection Kit (VW-DTA10E/VW-DTA9E)
15) DV Editing Software with DV Interface Board (VW-DTM21E)
16) DV Editing Software with DV Interface Card (VW-DTM22E)
17) DV Editing Software (VW-DTM20E)
18) DV Cable (VW-CD1E)

- Some optional accessories may not be available in some countries.



Getting Started

1 Charge the Battery. (➔ 10)

- Attach the Battery to the AC Adaptor.
- Connect the AC Mains Lead. (Charging starts.)
- When the Charge Lamp [CHARGE] goes off, the Battery is fully charged.

2 Attach the Charged Battery to the Movie Camera. (➔ 10)

3 Insert the Cassette. (➔ 12)

- Slide the ❶ Lever to open.
- Insert the Cassette.
- Press the ❷ Button to close the Cover.

4 Turn the Movie Camera on and start recording. (➔ 12, 18)

- Set the ❸ Switch to [CAMERA]. (The [POWER] Lamp lights up.)
- Press the ❹ Button. (Recording starts.)
- Press the ❹ Button again to pause the recording.

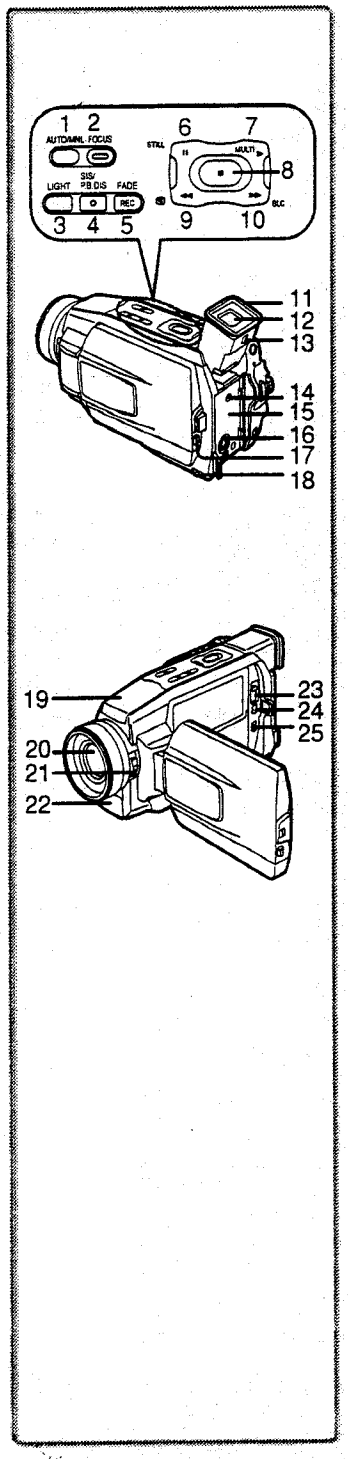
Viewing What Has Been Recorded

5 Switch to the VCR Mode, rewind the tape, and play the tape back. (➔ 30)

- Set the ❺ Switch to [VCR].
- Press the ❻ Button. (Rewind the tape.)
- Press the ❼ Button. (Playback starts.)
- Press the ❽ Button. (Playback stops.)

6 Turn the Movie Camera off. (➔ 12)

- Set the ❾ Switch to [OFF].



Controls and Components

1) **Mode Selector Button [AUTO/MNL] (➔ 18, 25, 26, 27)**
2) **Focus Button [FOCUS] (➔ 27)**
3) **DC Light Button [LIGHT] (➔ 19)**
4) **Super Image Stabilizer Button [SIS] (➔ 22)**
   Playback Digital Image Stabilizer Button [P.B.DIS] (➔ 30)
5) **Fade Button [FADE] (➔ 22)**
   Recording Button [REC] (NV-DS30 only) (➔ 37)
6) **Still Button [STILL] (➔ 20, 29)**
   Pause Button [❚❚] (➔ 32)
7) **Play Button [▶] (➔ 30)**
   Playback Multi Button [MULTI] (➔ 30)
8) **Stop Button [■] (➔ 30)**
9) **Recording Check Button [⟲] (➔ 18)**
   Rewind/Review Button [◀◀] (➔ 30, 31)
10) **Backlight Button [BLC] (➔ 23)**
    Fast Forward/Cue Button [▶▶] (➔ 31)
11) **Eyecup**
12) **Viewfinder (➔ 13, 45)**

- **Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the Viewfinder screen. However, this is not a malfunction and does not affect the recorded picture.**

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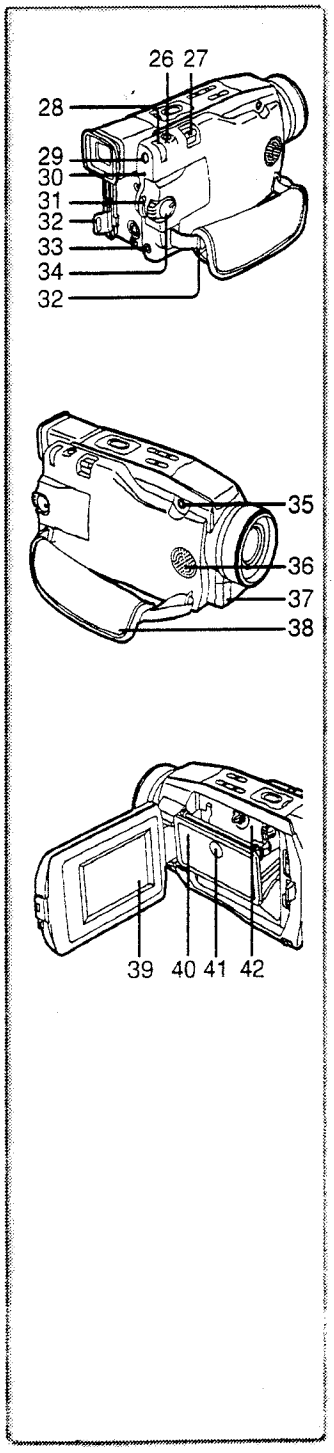
13) **Eyepiece Corrector Knob (➔ 13)**
14) **DC Input Socket [DC IN] (➔ 10)**
15) **Battery Holder**
16) **S-Video Output Socket [S-VIDEO] (➔ 35, 36)**
17) **LCD Monitor Open Button [PUSH OPEN] (➔ 13)**
18) **Battery Release Lever [BATT RELEASE] (➔ 10)**
19) **Microphone (built-in, stereo) (➔ 21)**
20) **Lens**
21) **0-Lux Recording Switch [0 LUX ON/OFF] (➔ 23)**
22) **Built-in DC Light (➔ 19)**
23) **Cassette Eject Lever [TAPE EJECT] (➔ 12)**
24) **DV Terminal (i.LINK)[i]**
    (Input function on NV-DS30 Model only) (➔ 37)
    - Connect this to the digital video equipment.
    - "i.LINK" is the name of connectors in accordance with IEEE1394-1995. "i" is a logo marked on products comforming with the "i.LINK" specifications.
25) **Digital Still Picture Terminal [TO PC] (➔ 37)**



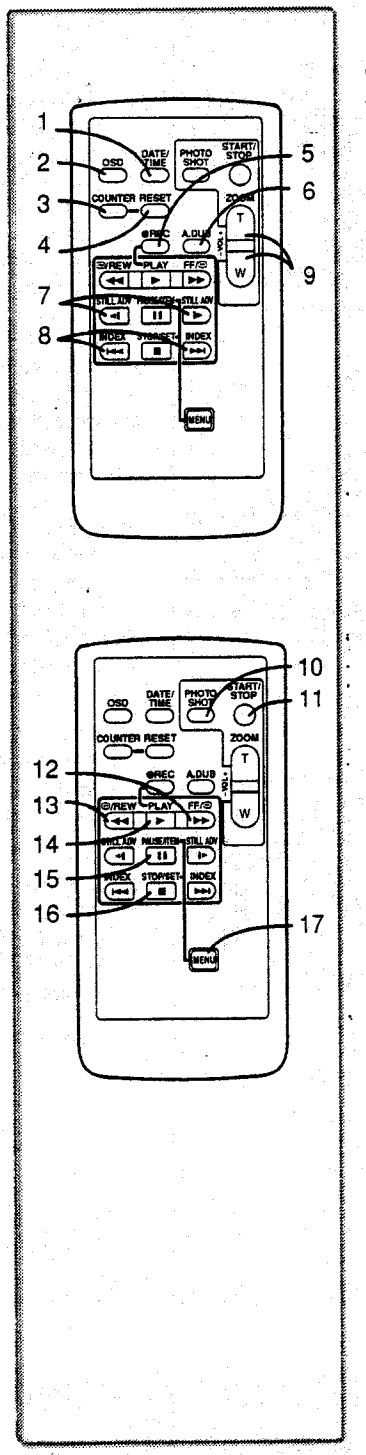
26) Photoshot Button [PHOTO SHOT] (➔ 20)
27) Zoom Lever [W/T] (➔ 21)
Volume Lever [VOLUME] (➔ 30)
28) Multi-Function Dial [PUSH] (➔ 14, 25, 26, 27)
29) Menu Button [MENU] (➔ 14)
30) Power Lamp [POWER] (➔ 18, 30)
31) Recording Start/Stop Button (➔ 18)
32) Shoulder Strap Holders (➔ 12)
33) Audio-Video Output Socket [A/V OUT] (➔ 35, 36)
Headphone Socket [PHONES] (➔ 41)
- Connecting an AV Cable to this socket activates the Movie Camera's built-in speaker, but connecting a headphone, etc. deactivates it.

34) Movie Camera Power Switch [VCR/OFF/CAMERA] (➔ 12, 18, 30, 42)
35) Microphone Socket [MIC]
- Connect with an external microphone or audio equipment. (When this socket is in use, the built-in microphone does not operate.)

36) Speaker (➔ 30)
37) White Balance Sensor (➔ 47)
Remote Control Sensor (➔ 9)
Built-in Infra-red Beam Emitters (➔ 23)
38) Grip Belt (➔ 11)
39) LCD Monitor (➔ 13, 45)

- **Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD Monitor screen. However, this is not a malfunction and does not affect the recorded picture.**

40) Cassette Compartment Cover (➔ 12)
41) Cassette Compartment Lock Button [PUSH LOCK] (➔ 12)
42) Cassette Holder (➔ 12)
43) Tripod Receptacle
- Used for mounting the Movie Camera on an optional tripod.



Remote Controller

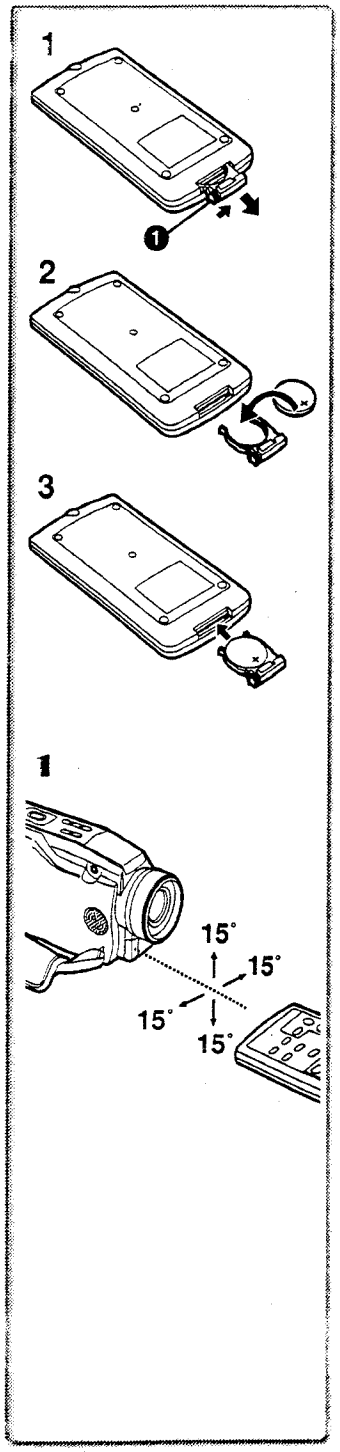
Using the wireless Remote Controller that is supplied with the Movie Camera, most of the Movie Camera functions can be operated from a distance.

Remote Controller Buttons

1) **Date/Time Button [DATE/TIME] (➜ 39)**
2) **Indication Output Button [OSD] (➜ 35)**
3) **Counter Indication Shift Button [COUNTER] (➜ 38)**
4) **Reset Button [RESET] (➜ 47)**
5) **Recording Button [REC]**
   (Available only with NV-DS30) (➜ 37)
6) **Audio Dubbing Button [A.DUB] (➜ 35)**
7) **Slow Motion/Still Advance Buttons**
   [◂I, I▸] (◂I: reverse, I▸: forward) (➜ 31)
8) **Index Search Buttons**
   [I◂◂, ▸▸I] (I◂◂:reverse, ▸▸I:forward) (➜ 33)
9) **Zoom/Volume Button [ZOOM/VOL] (➜ 21, 30)**

The following buttons function in the same manner as the corresponding buttons on the Movie Camera.

10) **Photoshot Button [PHOTO SHOT] (➜ 20)**
11) **Recording Start/Stop Button [START/STOP] (➜ 18)**
12) **Fast-forward/Cue Button [▸▸] (➜ 31)**
13) **Rewind/Review Button [◂◂] (➜ 30, 31)**
14) **Play Button [▸] (➜ 30)**
15) **Pause Button [II] (➜ 32)**
    Item Button [ITEM] (➜ 14)
16) **Stop Button [■] (➜ 30)**
    Set Button [SET] (➜ 14)
17) **Menu Button [MENU] (➜ 14)**



Inserting a Button-type Battery

Before using the Remote Controller, insert the supplied button-type battery.

1 **While pressing the Stopper ❶, pull out the Battery Holder.**

2 **Insert the button-type battery with the imprint (+) facing upward.**

3 **Insert the Battery Holder into the Remote Controller.**

- When the button-type battery is weak, replace it with a new CR2025 battery. (A battery is normally expected to last about 1 year. However, it depends on operation frequency.)
- Make sure to match the poles correctly when inserting the battery.

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

WARNING

Risk of fire, explosion and burns. Do not recharge, disassemble, heat above 100°C or incinerate. Keep the Button-Type battery out of the reach of children. Never put Button-Type battery in mouth. If swallowed call your doctor.

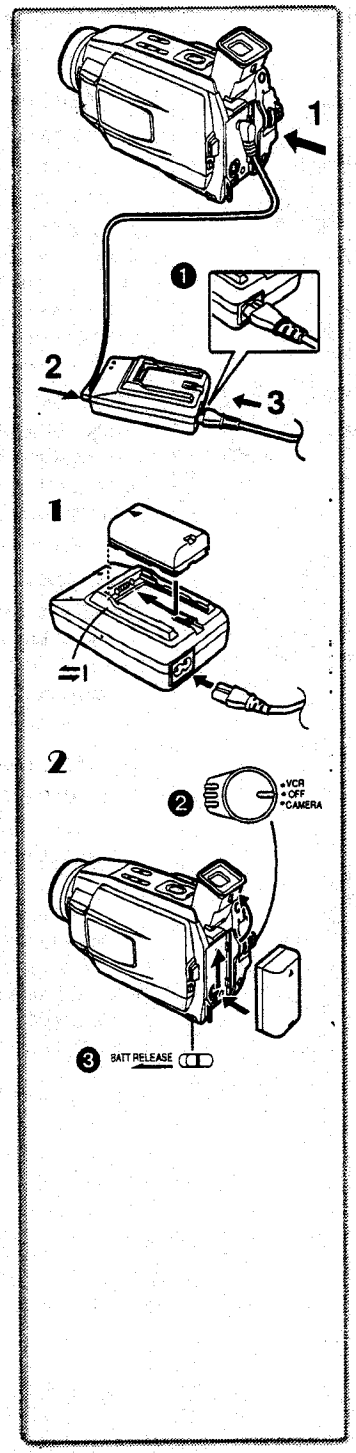
Using the Remote Controller

1 **Direct the Remote Controller to the Remote Control Sensor of the Movie Camera and press an appropriate button.**

- Distance from the Movie Camera:Within approximately 5 metres
- Angle: Within approximately 15° in the vertical and horizontal directions from the central axis

- The above operating ranges are for indoor use. Outdoors or under strong light, the Movie Camera may not operate properly even within the above ranges.

• For other notes concerning this item, see page 39.



Power Supply

■Using the AC Adaptor

1 Connect the DC Input Lead to the [DC IN] Socket on the Movie Camera.

2 Connect the DC Input Lead to the AC Adaptor.

3 Connect the AC Mains Lead to the AC Adaptor and the AC mains socket.

- The AC Mains Lead's outlet plug cannot be pushed fully into the AC Adaptor socket. A gap will remain as shown ❶.

- **Before connecting or disconnecting the power supply, set the Power Switch on the Movie Camera to [OFF] and make sure that the [POWER] Lamp is not lit.**

■Using the Battery

Before use, fully charge the Battery.

1 Attach the Battery to AC Adaptor and charge it.

- Since the Battery will not be charged when the DC Input Lead is connected to the AC Adaptor, disconnect them.
- The [POWER] Lamp and [CHARGE] Lamp lights up, and charging starts.
- When the [CHARGE] Lamp goes off, charging is completed.

2 Attach the charged Battery to the Movie Camera.

To Remove the Battery

Set the Power Switch ❷ to [OFF], and while pressing the [BATT RELEASE] Lever ❸, slide the Battery to remove it.

- **When attaching or removing Battery, set the Power Switch to [OFF] and make sure the [POWER] Lamp is not lit.**

■Using the Car Battery Charger

If you use the Car Battery Charger (VW-KBD2E; optional), you can supply power to the Movie Camera and charge the battery inside your car. For further information, refer to the instruction manual of the Car Battery Charger.

- Be sure to start the car engine before you connect the Car Adaptor Cord, otherwise the fuse may blow.

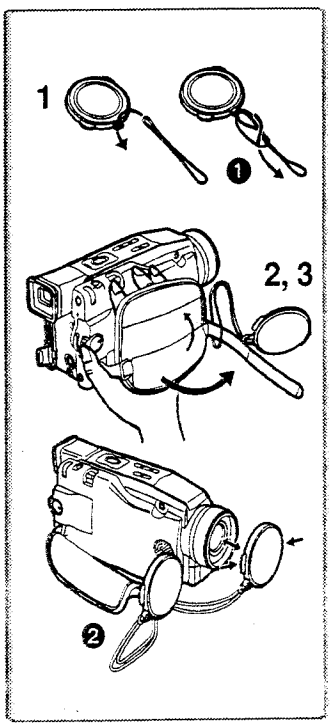
- For other notes concerning this item, see page 39.

Charging Time and Available Recording Time

		NV-DS29/NV-DS30
CGR-D08R	Ⓐ	0h00min.(0h00min.)
CGR-D08S	Ⓑ	0h00min.(0h00min.)
CGR-D120	Ⓒ	0h00min.(0h00min.)
CGR-D14S	Ⓐ	0h00min.(0h00min.)
CGR-D210	Ⓑ	0h00min.(0h00min.)
	Ⓒ	0h00min.(0h00min.)
CGR-D16S	Ⓐ	0h00min.(0h00min.)
CGR-D220	Ⓑ	0h00min.(0h00min.)
	Ⓒ	0h00min.(0h00min.)
CGR-D28S	Ⓐ	0h00min.(0h00min.)
CGR-D320	Ⓑ	0h00min.(0h00min.)
	Ⓒ	0h00min.(0h00min.)
CGR-D53S	Ⓐ	0h00min.(0h00min.)
CGR-D815	Ⓑ	0h00min.(0h00min.)
	Ⓒ	0h00min.(0h00min.)

Ⓐ Charging Time
Ⓑ Maximum Continuous Recording Time
Ⓒ Intermittent Recording Time
(Intermittent Recording Time is the available recording time with repeated recording and stopping actions.)

- "1h10min." indicates 1 hour and 10 minutes.
- Battery CGR-D08R is supplied.
- The times shown in the table are approximate times. The numbers in parentheses indicate the recording time when the LCD Monitor is used. In actual use, the available recording time may be shorter.
- The times shown in the table are for continuous recording at a temperature of 20°C and humidity of 60%. If the Battery is charged at a higher or lower temperature, the charging time may be longer.

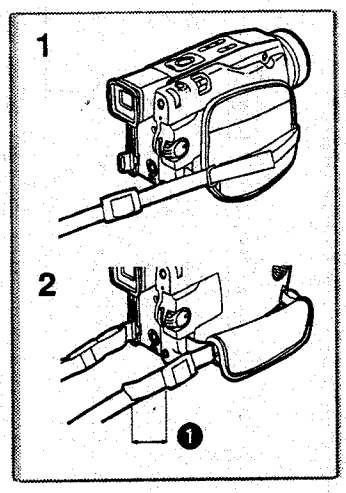


Lens Cap and Grip Belt

To protect the Lens surface, attach the Lens Cap. Adjust the length of the Grip Belt to the size of your hand.

1 **Pass the Lens Cap Cord through the attached eye on the Lens Cap and thread it as shown in the illustration ❶.**
2 **Attach the Lens Cap to the Grip Belt.**
3 **Put your hand through the Grip Belt and adjust the length.**

- The removed Lens Cap can be hooked onto the Grip Belt ❷. (When you are not recording, be sure to keep the Lens Cap attached to the Lens for protection.)



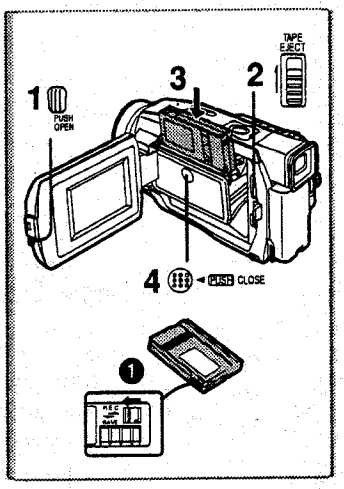
Attaching the Shoulder Strap

We recommend that you attach the Shoulder Strap before going out of doors to record so as to avoid dropping the Movie Camera.

1 **Pull the end of the Shoulder Strap through the Shoulder Strap Holder on the Movie Camera.**

2 **Fold the tip of the Shoulder Strap, run it through the Shoulder Strap Length Adjuster, and pull it.**

- Pull it out more than 2 cm ❶ from the Shoulder Strap Length Adjuster so that it cannot slip off.



Inserting a Cassette

When power is supplied to the Movie Camera, the Cassette can be taken out without turning the Movie Camera [ON].

1 **Press [PUSH OPEN] Button and open the LCD Moniter.**

2 **Slide the [TAPE EJECT] Lever to open the Cover.**

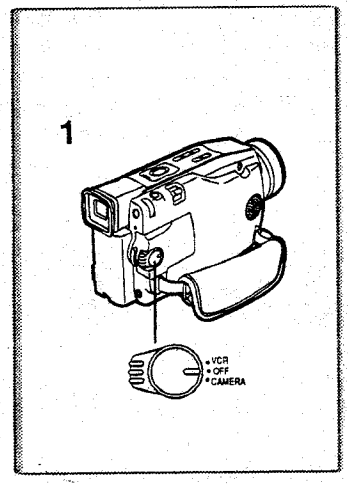
3 **Insert a Cassette.**

4 **Close the Cover and press the [PUSH LOCK] Button to lock the Cover.**

■Accidental Erasure Prevention

Opening the accidental erasure prevention slider ❶ on the cassette (by sliding it in the [SAVE] arrow direction) prevents recording. To enable recording, close the accidental erasure prevention slider (by sliding it in the [REC] arrow direction).

- For other notes concerning this item, see page 39.



Turning on the Movie Camera and Selecting Modes

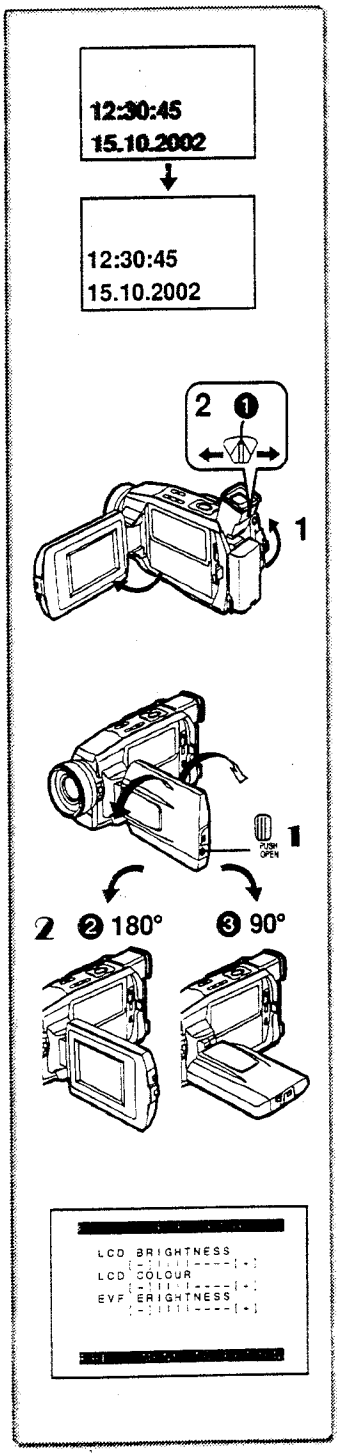
1 **Set the Power Switch to [CAMERA] or [VCR].**

- The [POWER] Lamp lights up.

CAMERA: Camera Mode
VCR: VCR Mode

To Turn off the Power

Set the Power Switch to [OFF].



Using the Viewfinder/LCD Monitor

■Using the Viewfinder

Before using the Viewfinder, adjust the field of view so that the displays inside the Viewfinder become clear and easy to read.

1 Tilt the Viewfinder upward.

- The Viewfinder can also be pulled out for use.
- Do not pull on the Eyecup to extend the Viewfinder.

2 Adjust by sliding the Eyepiece Corrector Knob ❶.

■Using the LCD Monitor

With the LCD Monitor open, you can also record the picture while watching it.

1 Press the [PUSH OPEN] Button and, at the same time, bring the LCD Monitor out about 90° in the direction of the arrow.

- The Viewfinder goes off.

2 Adjust the LCD Monitor angle according to the desired recording angle.

- The LCD Monitor can rotate a maximum of 180° ❷ from the vertical position to the upward direction and a maximum of 90° ❸ to the downward direction. Forcefully rotating the LCD Monitor beyond these ranges will damage the Movie Camera.

Closing the LCD Monitor

Push the LCD Monitor until the [PUSH OPEN] Button is securely locked.

■Adjusting Brightness and Colour Level

When [LCD/EVF SETUP] on the [CAMERA FUNCTIONS] or [VCR FUNCTIONS] Main-Menu is selected, the following items are displayed. **(→ 14)**

LCD Brightness [LCD BRIGHTNESS]

It adjusts the brightness of the image on the LCD screen.

LCD Colour Level [LCD COLOUR LEVEL]

It adjusts the colour saturation of the image on the LCD screen.

Brightness of the Viewfinder [EVF BRIGHTNESS]

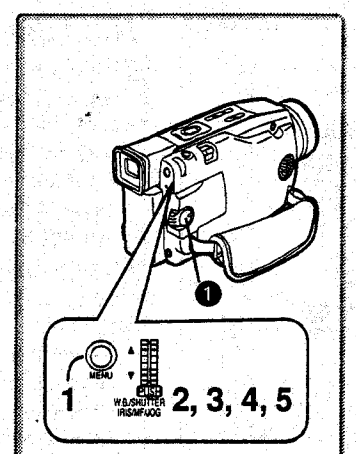
It adjusts the brightness of the image in the Viewfinder.

To Adjust

Press the [PUSH] Dial and select the item to be adjusted, and then turn the [PUSH] Dial to raise or lower the number of vertical bars in the Bar Indication.

- A larger number of vertical bars indicates stronger brightness or colour saturation.

- For other notes concerning this item, see page 45.



Using the Menu Screen

To facilitate the selection of a desired function or setup, this Movie Camera displays various function setups on Menus.

1 Press the [MENU] Button.

- The Menu corresponding to the Mode selected by using the [POWER] Switch ❶ is displayed.

2 Turn the [PUSH] Dial to select a desired Sub-Menu.

- Turn the [PUSH] Dial to display the highlightened item.

3 Press the [PUSH] Dial to display the selected Sub-Menu.

4 Turn the [PUSH] Dial to select the item to be set.

5 Press the [PUSH] Dial to set the selected item to a desired mode.

- With each pressing of the [PUSH] Dial, the cursor [▶] moves to the next mode. Menu items that cannot be used in combination with the selected item are displayed in dark blue.

- While a Menu is displayed, you cannot record or play back. Menus can be displayed during playback but not during recording. The above operations can be done using the [MENU] Button, [SET] Button and [ITEM] Button on the Remote Controller. **(➜ 8)**

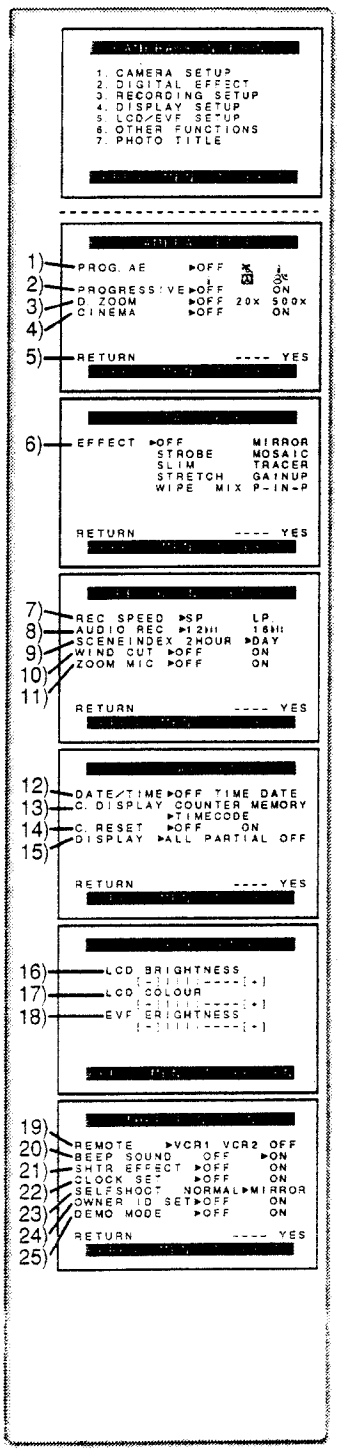
To Exit the Menu Screen

Press the [MENU] Button again.

About the Menu Mode Setting

The setting selected on the Menu will be retained even when the Movie Camera is turned off. However, if the Battery or AC Adaptor is disconnected before turning off the Movie Camera, the selected setup may not be retained.

- Menu operation flow is shown in this text by >>.



List of Menus

The figures of the Menus are for explanation purposes only, and they are different from the actual Menus.

Camera Mode Main-Menu [CAMERA FUNCTIONS]

[CAMERA SETUP] Sub-Menu

1) Auto Exposure Mode [PROG.AE] (➜ **24**)
2) Progressive Photoshot Mode [PROGRESSIVE] (➜ **20**)
3) Digital Zoom [D.ZOOM] (➜ **21**)
4) Cinema-like Format Recording [CINEMA] (➜ **23**)
5) Returning to the Main-Menu [RETURN]

[DIGITAL EFFECT] Sub-Menu

6) Digital Effects [EFFECT] (➜ **28**)

[RECORDING SETUP] Sub-Menu

7) Recording Speed Mode [REC SPEED] (➜ **19**)
8) Audio Recording Mode [AUDIO REC] (➜ **19**)
9) Scene Index Mode [SCENEINDEX] (➜ **33**)
10) Wind Noise Reduction [WIND CUT] (➜ **24**)
11) Zoom Microphone [ZOOM MIC] (➜ **21**)

[DISPLAY SETUP] Sub-Menu

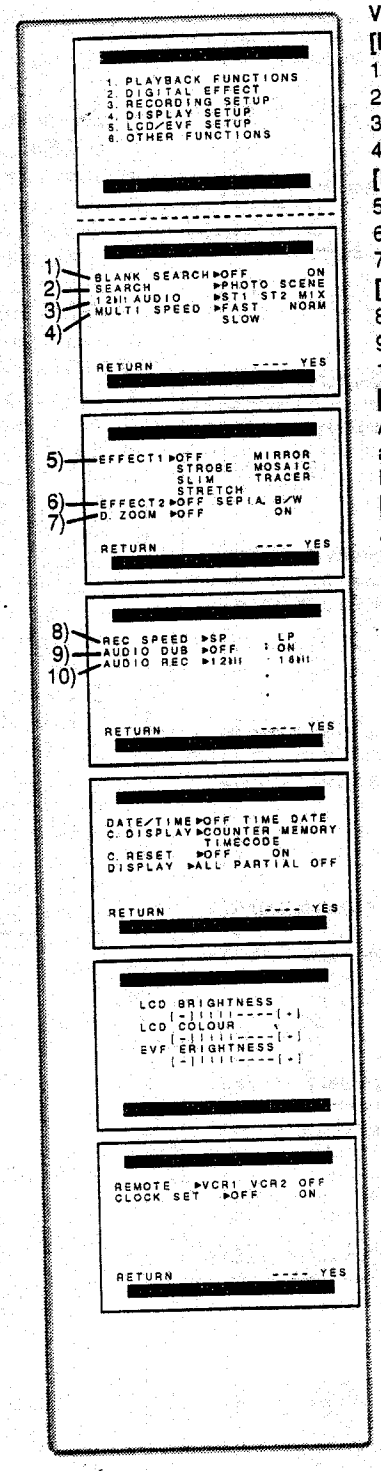
12) Date and Time Indication [DATE/TIME] (➜ **39**)
13) Counter Display Mode [C.DISPLAY] (➜ **38**)
14) Counter Reset [C.RESET] (➜ **47**)
    - It resets the counter to zero. However, it cannot reset the Time Code.
15) Display Mode [DISPLAY] (➜ **39**)

[LCD/EVF SETUP] Sub-Menu

16) LCD Brightness [LCD BRIGHTNESS] (➜ **13**)
17) LCD Colour Level [LCD COLOUR] (➜ **13**)
18) Brightness of the Viewfinder [EVF BRIGHTNESS] (➜ **13**)

[OTHER FUNCTIONS] Sub-Menu

19) Remote Controller Mode [REMOTE] (➜ **39**)
20) Beep Sound [BEEP SOUND] (➜ **39**)
21) Shutter Effect [SHTR EFFECT] (➜ **20**)
22) Date and Time Setting [CLOCK SET] (➜ **17**)
23) Self-Recording [SELFSHOOT] (➜ **19**)
24) Owner ID Set [OWNER ID SET] (➜ **48**)
25) Demonstration Mode [DEMO MODE]



VCR Mode Main-Menu [VCR FUNCTIONS]

[PLAYBACK FUNCTIONS] Sub-Menu

1) Blank Search [BLANK SEARCH] **(➔ 32)**
2) Index Search Mode [SEARCH] **(➔ 33)**
3) Audio Selector [12bit AUDIO] **(➔ 35)**
4) Multi-Picture Mode [MULTI SPEED] **(➔ 30)**

[DIGITAL EFFECT] Sub-Menu

5) Digital Effects 1 [EFFECT1] **(➔ 34)**
6) Digital Effects 2 [EFFECT2] **(➔ 34)**
7) Digital Zoom [D.ZOOM] **(➔ 34)**

[RECORDING SETUP] Sub-Menu

8) Recording Speed Mode [REC SPEED] **(➔ 19)**
9) Audio Dubbing [AUDIO DUB] **(➔ 35)**
10) Audio Recording Mode [AUDIO REC] **(➔ 35)**

[DISPLAY SETUP] Sub-Menu

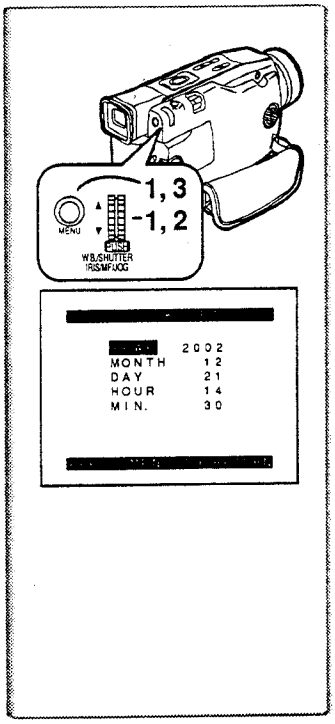
All of the items on the [DISPLAY SETUP] Sub-Menu are the same as those on the [DISPLAY SETUP] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu.

[LCD/EVF SETUP] Sub-Menu

All of the items on the [LCD/EVF SETUP] Sub-Menu are the same as those on the [LCD/EVF SETUP] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu.

[OTHER FUNCTIONS] Sub-Menu

All of the items on the [OTHER FUNCTIONS] Sub-Menu are the same as those on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu.



Setting Date and Time

Since the internal clock of the Movie Camera has a slight imprecision, make sure to check the time before recording.

1 **Set [OTHER FUNCTIONS] >> [CLOCK SET] >> [ON].**

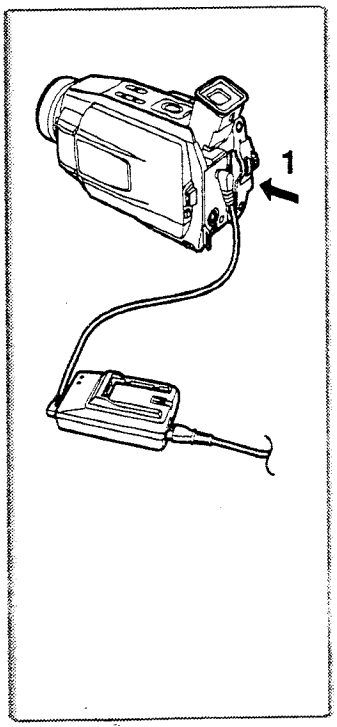
2 **Press the [PUSH] Dial to select [YEAR]/[MONTH]/[DAY]/[HOUR]/[MIN.] and turn to set it to a desired value.**

- Year will cycle in the order shown below.
  2000, 2001, ..., 2089, 2000, ...

3 **Press the [MENU] Button to finish setting the date and time.**

- The clock operation starts from [00] second.
- The Menu will disappear when the [MENU] Button is pressed again.

- If the built-in battery is weak, the [ ] indication ❶ flashes. In this case, charge the built-in battery.
- The clock employs the 24-hour system.

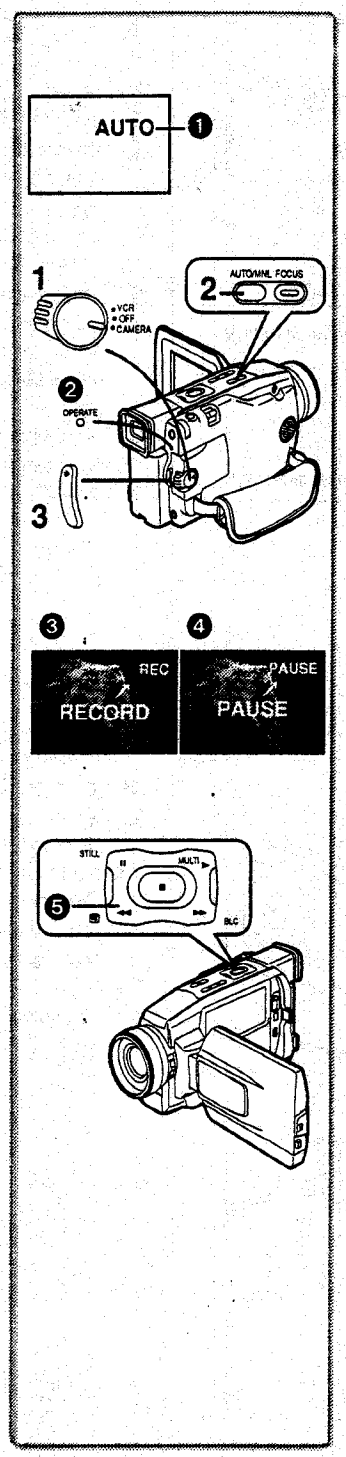


Internal Lithium Battery Recharge

- The internal lithium battery sustains the operation of the clock. When the [ ] indication is lit, the internal lithium battery is near exhaustion.

1 **Connect the AC adaptor to the Movie Camera with the power turned off and then connect to the AC Mains socket.**

- After charging for 4 hours, the built-in lithium battery can power the clock for approximately 3 months.



CAMERA Mode

Recording

When the [AUTO] indication ❶ is displayed on the screen, the Movie Camera automatically adjust the focus and white balance. Ir some cases, they cannot be adjusted automatically and need to be adjusted manually. (➔ 25, 27)

1 Set the Power Switch to [CAMERA].

- The [POWER] Lamp lights up. ❷

2 Press the [AUTO/MNL] Button to display the [AUTO] indication.

3 Press the Recording Start/Stop Button.

- Recording starts.
- After the [RECORD] is displayed, it changes to [REC]. ❸

To Pause the Recording

Press the Recording Start/Stop Button again.

The [PAUSE] Indication is displayed. ❹

- If the Recording Pause Mode continues for more than 6 minutes, the power is turned off automatically for tape protection and powe conservation. To resume recording from this condition, turn on the power again.

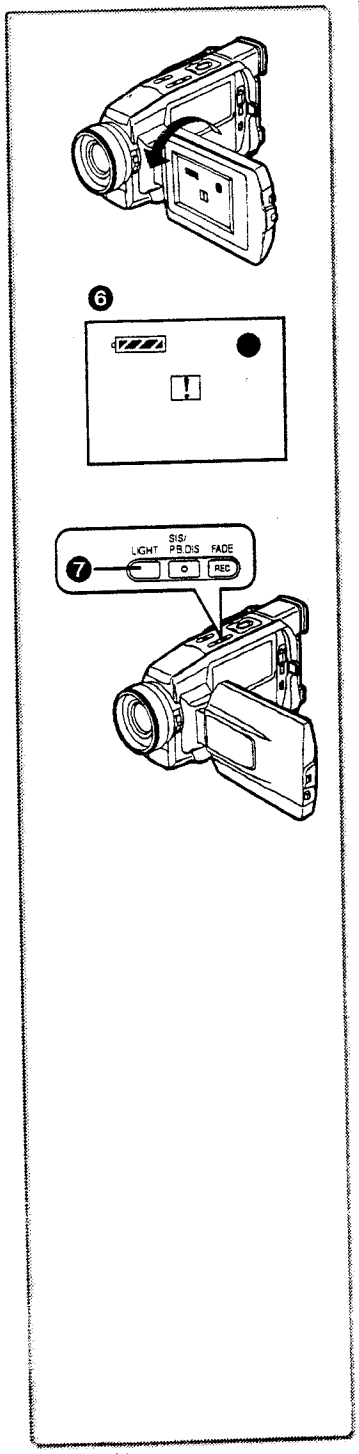
To Check the Recording

By pressing the [⏪] Button ❺ briefly in the Recording Pause Mode, you can play back the last few seconds of the recorded scene.

- The [CHK] Indication is displayed. After checking, the Movie Camera resumes the Recording Pause Mode.

To Finish the Recording

Set the Power Switch to [OFF].



Recording Yourself

By opening the LCD Monitor and rotating it frontward (to the lens side), you can let the subject in front of the Movie Camera monitor the shot while recording is in progress.

- When the LCD Monitor is opened, the Viewfinder is disabled automatically. However, when the LCD Monitor is rotated frontward, the image is also shown in the Viewfinder.
- If you prefer to have the image on the LCD Monitor to look like an image in a mirror, set [SELFSHOOT] on the [OTHER FUNCTIONS] Sub-Menu to [MIRROR].
  Images are recorded normally and no left and right reversal occurs.
- If [MIRROR] is used during self-recording, only the basic indications, such as the Recording Indication [●], Recording Pause Indication [●❚❚] and Remaining Battery Power Indication [▰▰▰], are displayed. ❻
- If a general Warning/Alarm Indication [⚠] appears, return the LCD Monitor to the original position in order to check the specific content of the Warning/Alarm Indication.

Recording with the Build-in DC Light

By using the Built-in DC Light, you can record the scenes in the dark place.

- If you Press the [LIGHT] Button ❼ for about 1 second, the Built-in DC Light lights.

LP Mode

A desired recording speed can be selected with [REC SPEED] on the [RECORDING SETUP] Sub-Menu.

If LP Mode is selected, the recording time becomes 1.5 times longer than that of SP Mode.

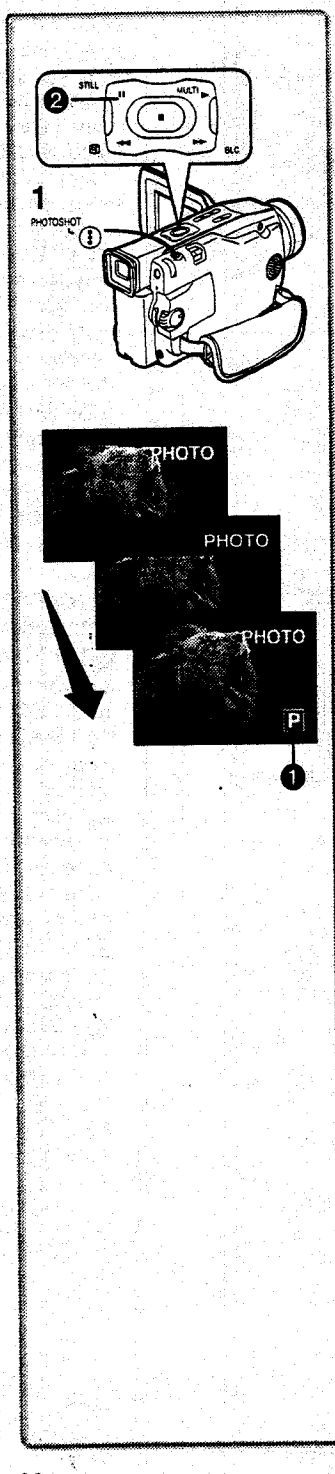
Although the image quality does not decrease with the LP Mode recording, mosaic-pattern noise may appear on a playback image, or some normal functions may be restricted.

- The contents that are recorded in LP Mode are not completely compatible with other equipment.
- Audio dubbing is not possible with LP Mode. (➔ 35)

Audio Recording Mode

The sound quality of the recorded sound can be selected with [AUDIO REC] on the [RECORDING SETUP] Sub-Menu.High sound-quality recording is possible with "16 bit 48 kHz 2 track" Mode. With the "12 bit 32 kHz 4 track" Mode, the original sound can be recorded on 2 tracks in stereo, while the other 2 tracks can be used for Audio Dubbing.

- For other notes concerning this item, see page 40.



Photoshot

This Movie Camera can take approximately 7 seconds still pictures containing sound.

1 Press the [PHOTO SHOT] Button in the Recording Pause Mode.

- The Movie Camera records a still picture for about 7 seconds and then switches back to the Recording Pause Mode.

■Progressive Photoshot

With the Progressive Photoshot Function, you can record still pictures with higher resolution than with the normal Photoshot Function.

- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON], the [P] Indication ❶ is displayed. When the [P] Indication is displayed, press the [PHOTO SHOT] Button in the Recording Pause Mode.
- This function may not work with some function setups.

■Continuous Photoshot

If the [PHOTO SHOT] Button continues to be pressed when the [SHTR EFFECT] on the [OTHER FUNCTIONS] Sub-Menu is set to [ON], the Movie Camera will continuously record still pictures in approximately 0.7 second intervals until the button is released. (However, this does not operate when using Progressive Photoshot.)

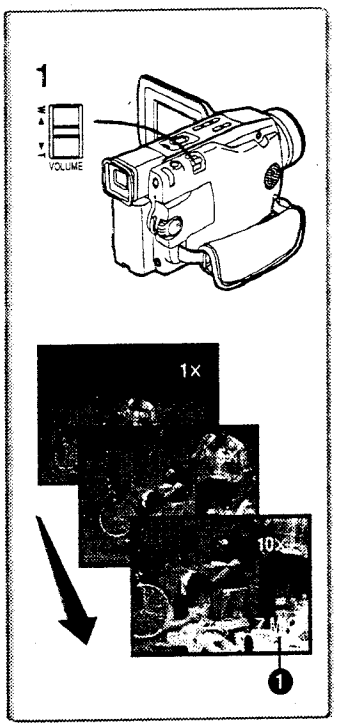
- The screen blinks and, at the same time, a shutter clicking sound is recorded.

■Digital Still Picture

When the [STILL] Button ❷ is pressed for about 1 second, images become still pictures. When the button is pressed for about 1 second again, the Digital Still Picture Mode is cancelled.

- We recommend that you press the [STILL] Button first at the position where you wish to record the picture so as to enter the Digital Still Picture Mode and then press the [PHOTO SHOT] Button.

- For other notes concerning this item, see page 40.



Zoom In/Out Functions

It gives special effects to the video by recording objects close by or with wide-angle shot.

1 **For wide-angle shots (zoom out):**
Push the [W/T] Zoom Lever towards [W].
For close-ups (zoom in):
Push the [W/T] Zoom Lever towards [T].

- Zoom Magnification Indication is displayed for a few seconds.

To Take Close-up Shots of Small Subjects
(Macro Close-up Function)

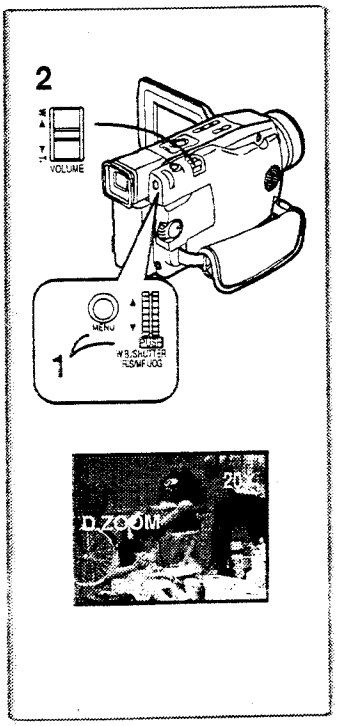
When the zoom magnification is 1×, the Movie Camera can focus on a subject that is as close as approximately 30 mm from the Lens. With this, small subjects like insects can be recorded.

To Use the Zoom Microphone Function

Along with the zooming operation, the microphone's directional angle and sensitivity are varied for recording sounds.

- Set [ZOOM MIC] on the [RECORDING SETUP] Sub-Menu to [ON]. (The [Z.MIC] Indication is displayed. ❶)
- The Zoom Microphone Function may not work effectively if the surrounding noise is too loud.

- For other notes concerning this item, see page 40.



Digital Zoom Function

This function is useful when you want to record close-up shots of subjects located beyond a normal zoom range of 1× to 10× magnification. With the Digital Zoom Function, you can select a magnification of 20× or even to 500×.

1 **Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [D.ZOOM] >> [20×] or [500×].**
- 20×: Digital zooming to 20×
- 500×: Digital zooming to 500×

2 **Push the [W/T] Zoom Lever towards [W] or towards [T] to zoom in or out.**

To Cancel the Digital Zoom Function

Set [D.ZOOM] on the [CAMERA SETUP] Sub-Menu to [OFF].

- As the magnification of digital zoom increases, the quality of image may deteriorate.
- White balance cannot be set in the digital zoom range.

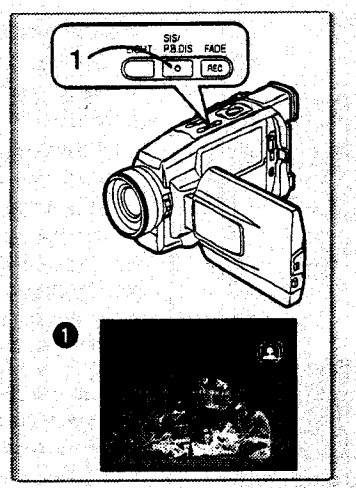


Image Stabilizer Function

If the Movie Camera might be shaken while recording, the camera shake in the image can be corrected.

- If the Movie Camera shakes too much, this function may not be able to stabilize images.

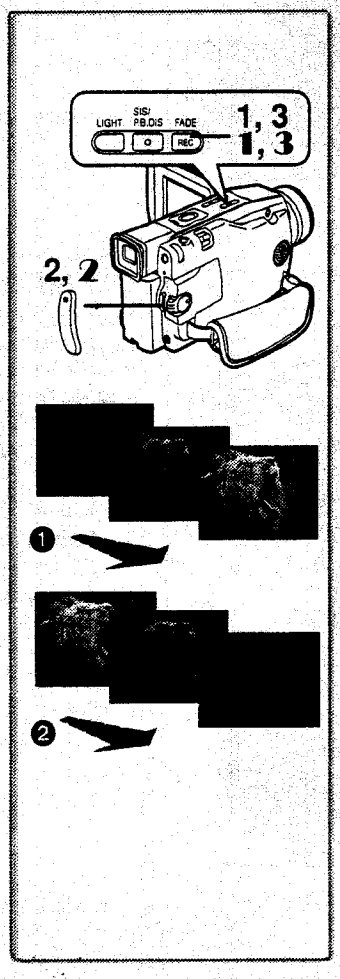
1 Press the [SIS] Button.

- The [ ] Indication ❶ appears.

To Cancel Image Stabilizer

Press the [SIS] Button.

- For other notes concerning this item, see page 40.



Fade In/Out Functions

Fade In ❶

Fade In brings out images and sounds gradually from a black screen at the beginning of a scene.

1 Keep pressing the [FADE] Button during the Recording Pause Mode.

- The image fades out gradually.

2 When the image is completely gone, press the Recording Start/Stop Button to start recording.

3 Release the [FADE] Button about 3 seconds after starting recording.

- The image reappears gradually.

Fade Out ❷

Fade Out causes images and sounds to disappear gradually, leaving a black screen at the end of a scene.

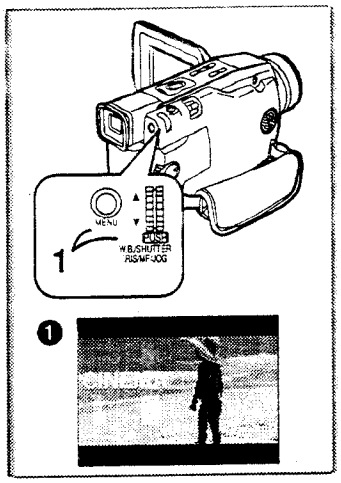
1 Keep pressing the [FADE] Button while recording.

- The image fades out gradually.

2 When the image is completely gone, press the Recording Start/Stop Button to stop recording.

3 Release the [FADE] Button.

- The still picture cannot fade in or fade out.



Cinema Function

This function is for recording in a cinema-like wide screen.

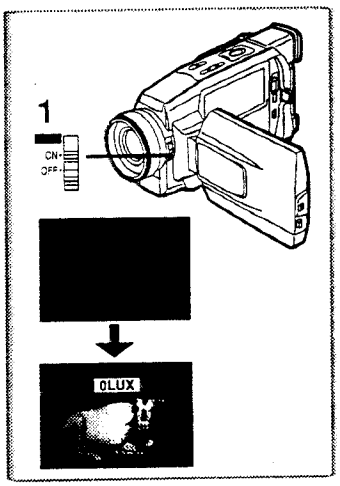
1 Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [CINEMA] >> [ON].

- Black bars appear at the top and bottom of the screen. ❶

To Cancel the Cinema Mode

Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [CINEMA] >> [OFF].

- For other notes concerning this item, see page 40.



0 Lux Night View Function

Your Movie Camera emits infra-red rays so as to record subjects that cannot be seen with the naked eye.

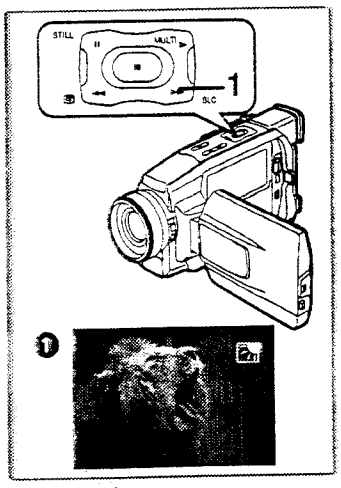
1 Set the [0 LUX ON/OFF] Switch to [ON] to make the [0LUX] Indication appear.

- Built-in Infra-red Beam Emitters ❶ light up. Be careful not to cover them with your hand during recording.

To cancel the 0 Lux Night View Function

Set the [0 LUX ON/OFF] Switch to [OFF] to turn off the [0LUX] Indication.

- For other notes concerning this item, see page 40.



Backlight Compensation Function

This prevents a recording subject from being recorded darker in backlight. (Backlight is the light that shines from behind a recording subject.)

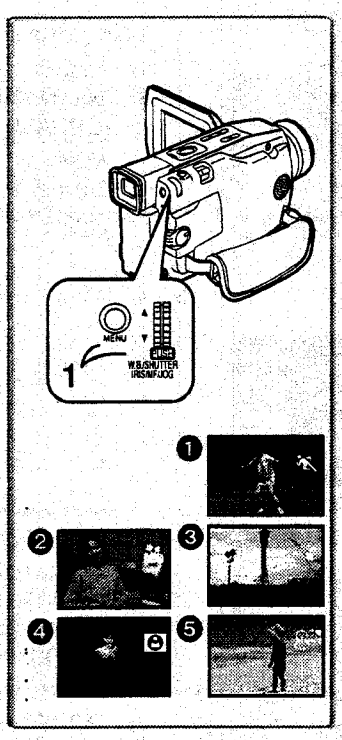
1 Press the [BLC] Button.

- The [BLC] Indication ❶ flashes and then is displayed.

To Resume Normal Recording

Press the [BLC] Button.

- When the [BLC] Button is pressed, the entire screen becomes brighter.
- By operating the Power Switch, the Backlight Compensation Function is cancelled.



Recording in Special Situations

(Programme AE)

You can select optimal automatic exposures under specific recording situations.

1 Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [PROG.AE] >> a desired mode.

- The Indication for the selected mode appears.

[ ] Sports Mode ❶

For recording scenes involving quick movements, such as sports scenes.

[ ] Portrait Mode ❷

For bringing up people clearly from the background.

[ ] Low Light Mode ❸

For recording a dark scene brighter.

[ ] Spotlight Mode ❹

For recording a subject under spotlight in a party, theatre, etc.

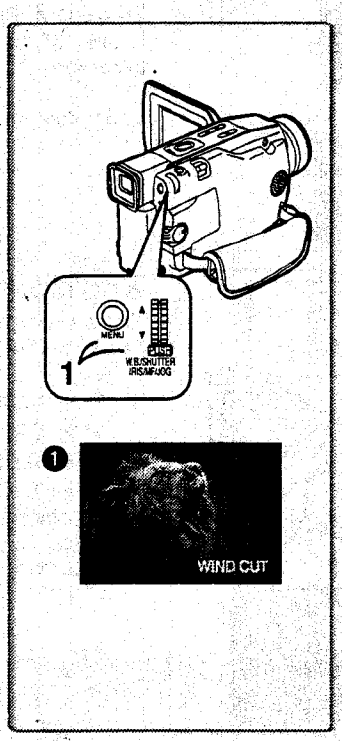
[ ] Surf & Snow Mode ❺

For recording in a glaring surrounding, such as skiing grounds, beaches, etc.

To Cancel the Programme AE Function

Set [CAMERA FUNCTIONS] >> [CAMERA SETUP] >> [PROG.AE] >> [OFF].

- For other notes concerning this item, see page 40.

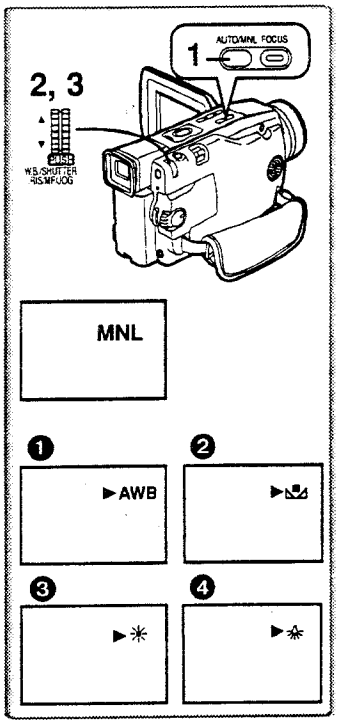


Wind Noise Reduction Function

This function reduces the sound of a wind hitting the microphone for recording.

1 Set [CAMERA FUNCTIONS] >> [RECORDING SETUP] >> [WIND CUT] >> [ON].

- The [WIND CUT] Indication ❶ appears.



Recording in Natural Colours

(White Balance)

Depending on the scene or light condition, the Automatic White Balance Adjustment Mode may not be able to bring out natural colours. (➔ 26, 47) In such a case, the white balance can be adjusted manually.

1 Press the [AUTO/MNL] Button for about 1 second to display the [MNL] Indication.

2 Press the [PUSH] Dial.

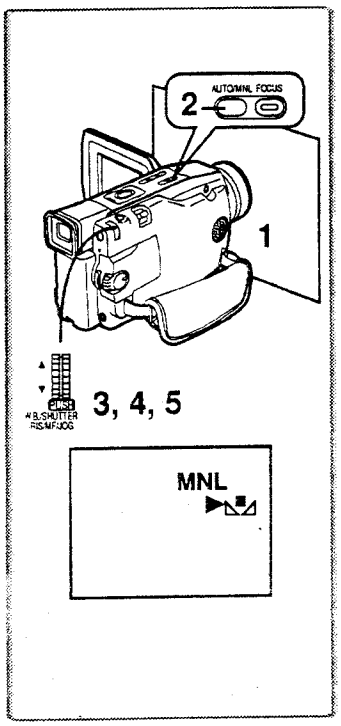
- The [AWB] Indication appears.

3 Turn the [PUSH] Dial to set a desired White Balance Mode.

❶ Automatic White Balance Adjustment [AWB]
❷ The white balalnce setting that was previously set manually [ ]
❸ Outdoor Mode [ ]
❹ Indoor Mode (recording under incandescent lamp) [ ]

To Resume Automatic Adjustment

Turn the [PUSH] Dial until the [AWB] Indication appears. Or, press the [AUTO/MNL] Button for about 1 second to display the [AUTO] Indication.



Adjusting White Balance Manually

For light outside the functional Auto White Balance Adjustment range, use the Manual White Balance Adjustment Mode.

1 Point the Movie Camera at a full-screen white subject.

2 Press the [AUTO/MNL] Button for about 1 second to display the [MNL] Indication.

3 Press the [PUSH] Dial.

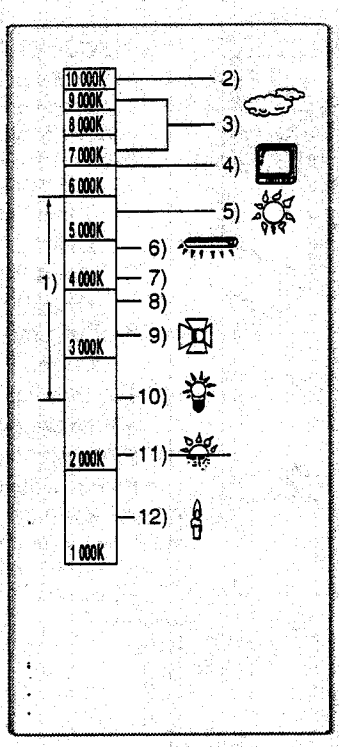
- The [AWB] Indication appears.

4 Turn the [PUSH] Dial until the [ ] Indication is displayed.

5 Keep pressing [PUSH] Dial until the [ ] Indication stops flashing.

To Resume Automatic Adjustment

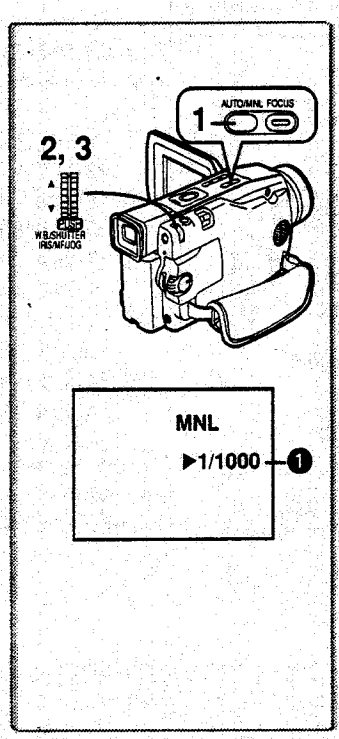
Turn the [PUSH] Dial until the [AWB] Indication is displayed. Or, press the [AUTO/MNL] Button for about 1 second to display the [AUTO] Indication.



Outside of the effective range of Automatic White Balance Adjustment, the image will become reddish or bluish. Even within the effective range of Automatic White Balance Adjustment, the Automatic White Balance Adjustment may not function properly if there is more than one light source. In this case, adjust the White Balance.

1) The effective range of Automatic White Balance Adjustment on this Movie Camera
2) Blue sky
3) Cloudy sky (Rain)
4) TV screen
5) Sunlight
6) White fluorescent lamp
7) 2 hours after sunrise or before sunset
8) 1 hour after sunrise or before sunset
9) Halogen light bulb
10) Incandescent light bulb
11) Sunrise or sunset
12) Candlelight

●For other notes concerning this item, see page 41.



Manual Shutter Speed Adjustment

It is useful for recording fast-moving subjects.

1 Press the [AUTO/MNL] Button for about 1 second to display the [MNL] Indication.

2 Press the [PUSH] Dial until the Shutter Speed Indication ❶ appears.

3 Turn the [PUSH] Dial to adjust the shutter speed.

Range of Shutter Speed Adjustment

1/60–1/8000 s

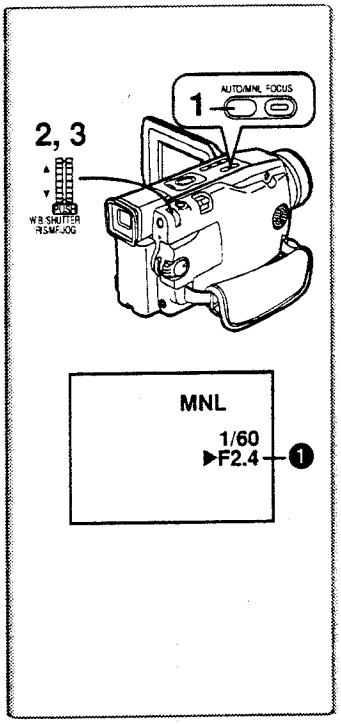
The standard shutter speed is 1/60 s.

Selecting a speed closer to [1/8000] causes the shutter speed to be faster.

To Resume Automatic Adjustment

Press the [AUTO/MNL] Button for about 1 second to display the [AUTO] Indication.

●For other notes concerning this item, see page 41.



Manual Iris Adjustment

(F Number)

You can use this function when the screen is too bright or too dark.

1 Press the [AUTO/MNL] Button for about 1 second to display the [MNL] Indication.

2 Press the [PUSH] Dial until the Iris Indication ❶ appears.

3 Turn the [PUSH] Dial to adjust the iris.

Range of Iris Adjustment

CLOSE (Closed), F16, ..., F2.0, OP (Opened)+0dB, ..., OP+18dB

When the Gain-up Mode [GAINUP] (➔ 28) is used, Iris adjustment is by OP+12dB.

When a value closer to [CLOSE] is selected, the image becomes darker.

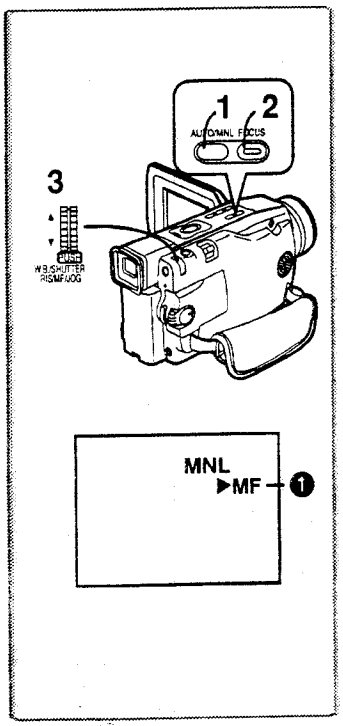
When a value closer to [OP+18dB] is selected, the image becomes brighter.

The value to which +dB is attached indicates a Gain-up value. If this value is too large, the quality of the image deteriorates.

To Resume Automatic Adjustment

Press the [AUTO/MNL] Button for about 1 second to display the [AUTO] Indication.

• For other notes concerning this item, see page 41.



Manual Focus Adjustment

Focus can be adjusted manually for recording in a situation where auto focus may not function well.

1 Press the [AUTO/MNL] Button for about 1 second to display the [MNL] Indication.

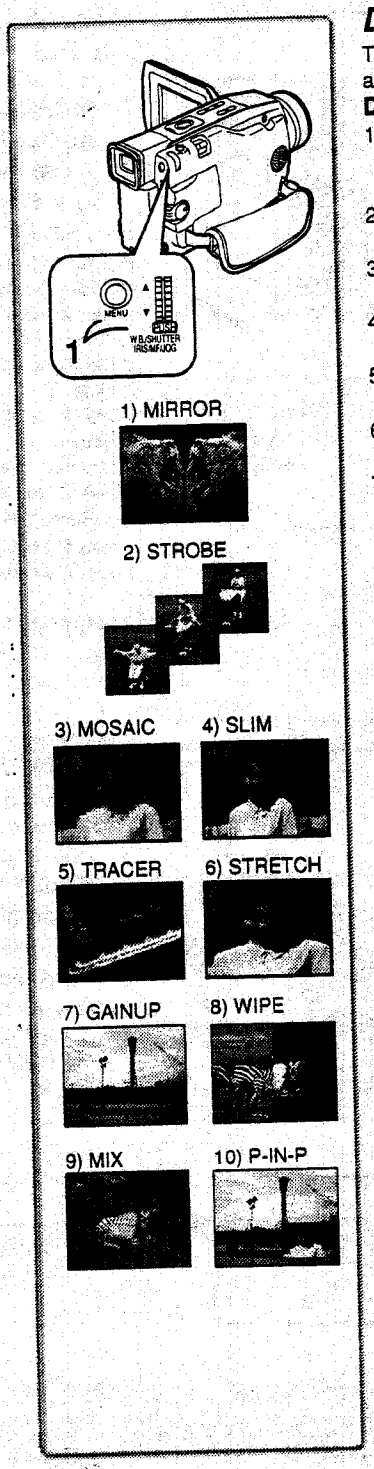
2 Press the [FOCUS] Button.

• The [MF] Indication (Manual Focus Mode) ❶ appears.

3 Turn the [PUSH] Dial to adjust the focus.

To Resume Automatic Adjustment

Press the [FOCUS] Button to turn off the [MF] Indication. Or, press the [AUTO/MNL] Button for about 1 second to display the [AUTO] Indication.



Digital Effect Functions

This Movie Camera is equipped with Digital Effect Functions that add special effects to the scene.

Digital Effects [EFFECT]

1) Mirror Mode [MIRROR]
   - The right half of an image becomes a mirror image of the left half.
2) Strobe Mode [STROBE]
   - It records images with a stroboscopic effect.
3) Mosaic Mode [MOSAIC]
   - It produces a mosaic-like image.
4) Slim Mode [SLIM]
   - The picture is expanded vertically.
5) Trailing Effect Mode [TRACER]
   - It records images with a trailing effect.
6) Stretch Mode [STRETCH]
   - The Picture is expanded horizontally.
7) Gain-up Mode [GAINUP]
   - It brightens images electronically.
   - Adjust focus manually when using this mode. **(➔ 27)**
8) Wipe Mode [WIPE] **(➔ 29)**
9) Mix Mode [MIX] **(➔ 29)**
10) Picture in Picture Mode [P-IN-P] **(➔ 29)**

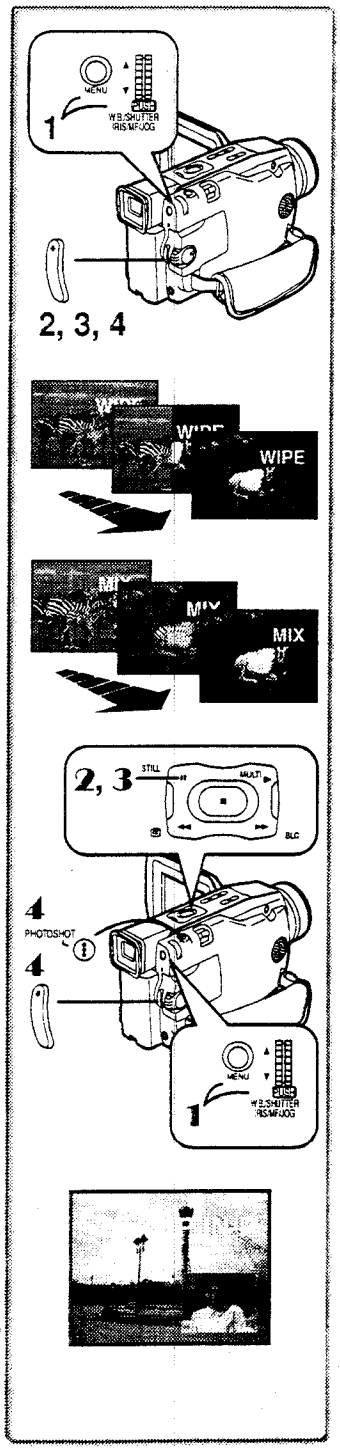
To Select a Desired Digital Effect

Set [CAMERA FUNCTIONS] >> [DIGITAL EFFECT] >> [EFFECT] >> a desired Digital Effect.

To Cancel the Digital Effect

Set [CAMERA FUNCTIONS] >> [DIGITAL EFFECT] >> [EFFECT] >> [OFF].

- For other notes concerning this item, see page 41.



■Wipe Mode and Mix Mode

Wipe Mode:

Like a curtain is being pulled, the still picture of the last recorded scene gradually changes to the moving image of a new scene.

Mix Mode:

While the moving image of a new scene fades in, the still image of the last recorded scene gradually fades out.

1 Set [DIGITAL EFFECT] >> [EFFECT] >> [WIPE] or [MIX].

- The [WIPE] or [MIX] indication appears.

2 Press the Recording Start/Stop Button to start recording.

3 Press the Recording Start/Stop Button to pause the recording.

- The last scene is stored in memory. The [WIPE] or [MIX] indication changes to [WIPE] or [MIX].

4 Press the Recording Start/Stop Button to restart the recording.

- The last image of the previous scene gradually changes to the new scene.

■Picture-in-Picture Mode

You can display a sub-screen (still picture) inside the screen.

1 Set [CAMERA FUNCTIONS] >> [DIGITAL EFFECT] >> [EFFECT] >> [P-IN-P].

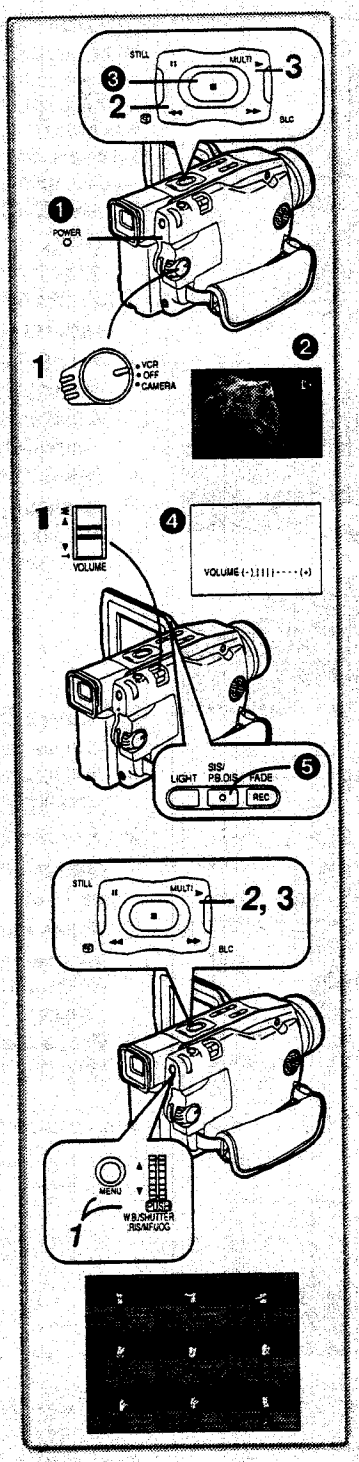
2 Aim the Movie Camera at the scene you want to capture and press the [STILL] Button for about 1 second.

3 Press the [STILL] Button for about 1 second again.

- A small still picture is displayed in a Normal picture.
- If the [STILL] Button is pressed again, the small still picture is cleared.

4 Press the Recording Start/Stop Button or the [PHOTO SHOT] Button to record on the Cassette.

- For other notes concerning this item, see page 41.



VCR Mode

Playing Back

The recorded scene can be played back immediately after the recording.

1 Set the Power Switch to [VCR].

- The [POWER] Lamp lights up. ❶

2 Press the [◀◀] Button to rewind the tape.

- Rewind the tape to the point where you want to start playback
- When the tape reaches the beginning, rewinding stops automatically.

3 Press the [▶] Button to start playback.

- The [▷] Indication ❷ appears.

To Stop Playback

Press the [■] Button. ❸

■ Adjusting the Sound Volume

1 Push the [VOLUME] lever in the VCR mode.

- The [VOLUME] Indication ❹ appears.

To adjust the volume with the Remote Controller, press the [T] or [W] Button to display the [VOLUME] Indication. Press the [T] Button to increase the volume or press the [W] Button to decrease the volume. The [VOLUME] Indication goes off a few seconds after the adjustment is finished.

- If a cassette recorded with a copyright protection signal is played back, the picture is distorted by mosaic-like patterns.

■ Playback Digital Image Stabilizer Function

Press the [P.B.DIS] Button ❺. (➜ 22)

- When using the Playback Digital Image Stabilizer Function, the image size is slightly larger.

■ Multi-Picture Mode

You can capture and record 9 consecutive small still pictures.

***1* Set [VCR FUNCTIONS] >>[RECORDING SETUP] >> [MULTI SPEED] >> [FAST], [NORM] or [SLOW].**

- Set the [MULTI SPEED] to a desired strobe speed. At the [FAST] setting, 9 consecutive still pictures is captured within approximately 1 second, at [NORM] within approximately 2 seconds, and at [SLOW] within approximately 3 seconds.

***2* Press the [▶] Button.**

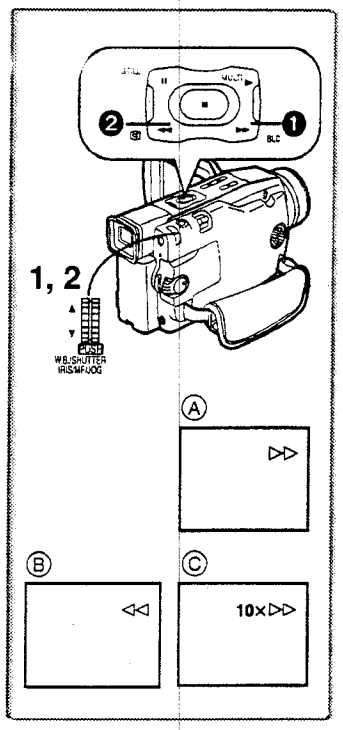
***3* Press the [MULTI (▶)] Button.**

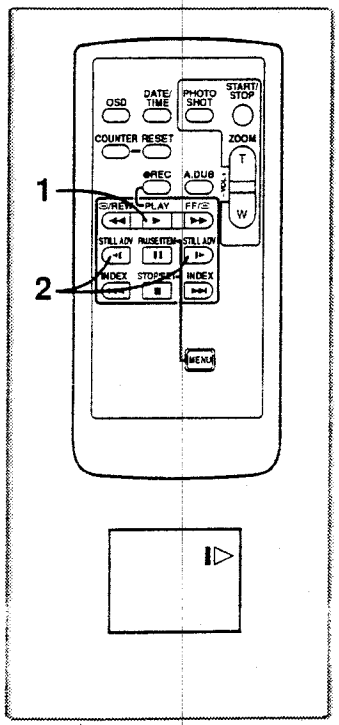
- After 9 small pictures are displayed, the Movie Camera is in the Still Playback Mode.

Deleting all the captured Multi-Pictures

While 9 small pictures are displayed, press the [MULTI] Button.

- For other notes concerning this item, see page 41.





Finding a Scene You Want to Play Back

■Cue/Review Playback

If the [▶▶] Button ❶ or [◀◀] Button ❷ is pressed during Playback, it turns to Cue Playback Ⓐ or Review Playback Ⓑ.

- If the Button is held continuously, it turns to Cue Playback or Review Playback until you release it.
- If the Button is pressed briefly, Cue Playback or Review Playback continues even when it is released.

■Variable Speed Search Function Ⓒ

The speed of Cue Playback or Review Playback can be varied.

1 Keep pressing the [PUSH] Dial during playback.

2 Turn the [PUSH] Dial to select a desired search speed.

The following 6 playback speeds are available for the Variable Speed Search Function in both the fast-forwarding and rewinding directions:

1/5× (slow playback in SP Mode only), 1/3× (slow playback in LP Mode only), 1×, 2×, 5×, 10× and 20×

■To Resume Normal Playback

Press the [▶] Button.

- During Cue or Review Playback, fast-moving images may show mosaic-pattern noise.
- The sound is muted during search.

Slow Motion Playback

This Movie Camera can play back at a slow speed.

1 Press the [▶] Button.

2 Press the [◀‖] Button or [‖▶] Button on the Remote Controller.

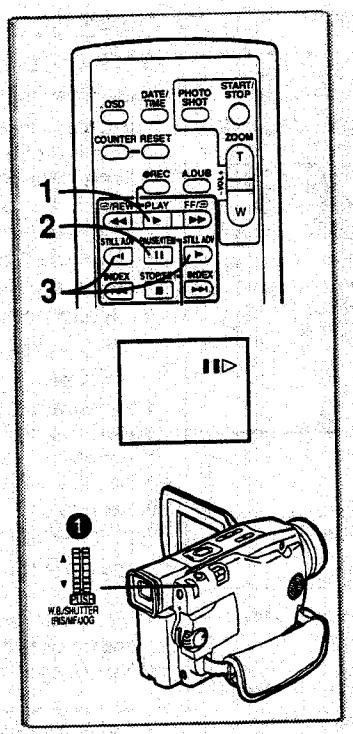
- When the [◀‖] Button is pressed, Slow Motion Playback proceeds in the reverse direction, while pressing the [‖▶] Button starts Slow Motion Playback in the forward direction.

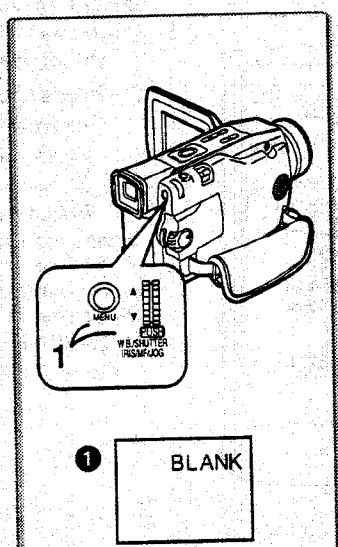
Scenes recorded in the SP Mode are played back at approximately 1/5th of the normal speed.

Scenes recorded in the LP Mode are played back at approximately 1/3rd of the normal speed.

To Resume Normal Playback

Press the [▶] Button.





Still Playback/Still Advance Playback

This Movie Camera is capable of still picture playback and frame-advance playback.

1 Press the [▶] Button.

2 Press the [❚❚] Button.

- The playback image stops in the Still Playback Mode.

3 Press the [◀❚] Button or [❚▶] Button on the Remote Controller.

- With each pressing of the [◀❚] Button, still pictures advance in the reverse direction. With each pressing of the [❚▶] Button, still pictures advances in the forward direction. If either one of the buttons continues to be pressed, still pictures advance continuously 1 frame at a time until the button is released.

To Resume Normal Playback

Press the [▶] Button.

■Jog Playback

By turning the Jog Dial ([PUSH] Dial) ❶ of the Movie Camera in the Still Playback Mode, still pictures can be advanced one frame at a time in the forward or backward direction.

- If the Movie Camera is left in the Still Playback Mode for more than 6 minutes, the Movie Camera switches to the Stop Mode to protect the video heads from excessive wear and tear.

Finding the End of Recording

(Blank Search Function)

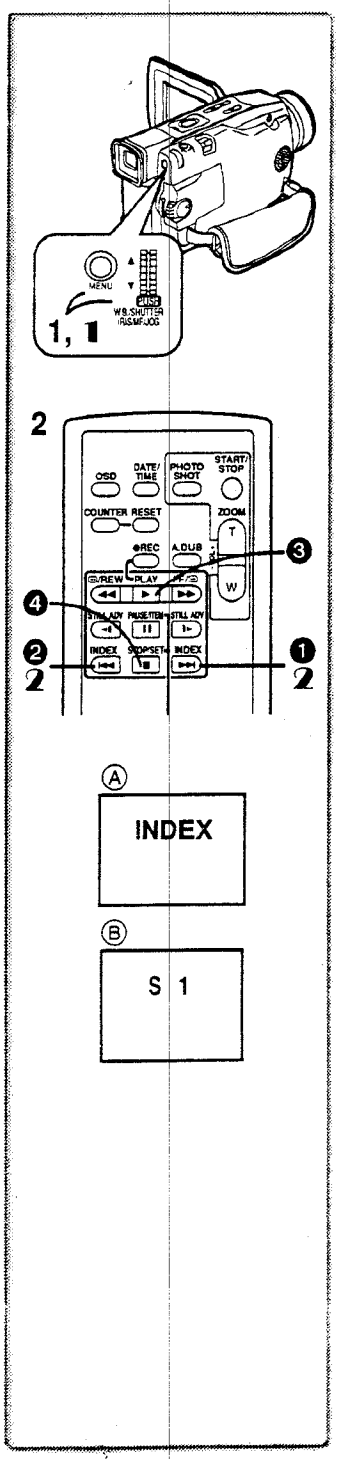
The Blank Search Function aids you locate the end of the recording on the Cassette quickly.

1 Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [BLANK SEARCH] >> [YES].

- The [BLANK] Indication appears ❶ during the Blank Search.
- Approximately 1 second before the last recorded scene, the Movie Camera switches to the Still Playback Mode.
- If there is no blank portion left on the Cassette, the Movie Camera stops at the end of the tape.

To Cancel Blank Search Before Completion

Press the [■] Button.



Index Search Functions

To facilitate searching of desired scene, this Movie Camera automatically records index signals during recording, as explained in the following.

Photoshot Index Signal

These signals are automatically recorded whenever still pictures are taken in Photoshot Mode. **(➔ 20)** Photoshot Index Signals are not recorded on still pictures recorded in Continuous Photoshot Mode.

Scene Index Signal

Scene Index Signals are automatically recorded when you start recording after inserting a Cassette.

- If [SCENEINDEX] of [RECORDING SETUP] Sub-Menu on the [CAMERA FUNCTIONS] Main-Menu is set to [2HOUR], an index signal is recorded when recording is restarted after an elapse of 2 hours or longer. If it is set to [DAY], an index signal is recorded when recording is restarted after the date has changed since the last recording. (While the index signal is recorded, the [INDEX] Indication flashes for a few seconds. Ⓐ)
- If the Movie Camera is switched from the VCR Mode to Camera Mode or if the date and time is set before the start of recording, the index signal is not recorded.

■ Photoshot Index Search

1 Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [SEARCH] >> [PHOTO].

2 Press the [▶▶I] Button ❶ or [I◀◀] Button ❷ on the Remote Controller.

- With each press of the corresponding button, still pictures recorded in Photoshot Mode are searched.
- Sounds are played back for approximately 4 seconds.

■ Scene Index Search

1 Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [SEARCH] >> [SCENE].

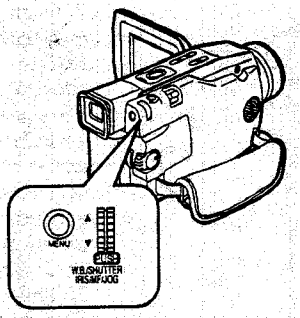
2 Press the [▶▶I] Button or [I◀◀] Button on the Remote Controller.

- When the corresponding button is pressed once, the [S 1] Indication Ⓑ appears, and searching of the subsequent scene marked with an index signal starts. Each time the button is pressed after the start of Scene Index Search, the indication changes from [S 2] to [S 9], and the beginning of the scene corresponding to the selected number will be searched.
- Up to 9 scene numbers can be selected.

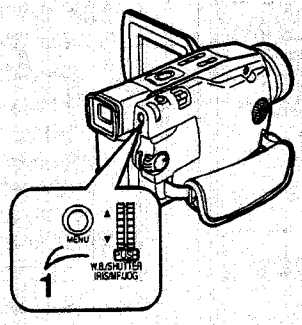
Continuous Index Search

If the [▶▶I] Button or the [I◀◀] Button is pressed for 2 seconds or longer, search can be continued at several-second intervals. (To cancel, press the [▶] Button ❸ or the [■] Button ❹.)

- For other notes concerning this item, see page 41.



1) SEPIA 2) B/W



Playback Digital Effect Functions

During playback, special digital effects can be added to the recorded pictures.

Digital Effects 1 [EFFECT1]

The same effects as those of Digital Effects, which are used during recording, are obtained. (➔ 28)

Digital Effects 2 [EFFECT2]

1) Sepia Mode [SEPIA]
   - It records a scene with a brownish tint, like the colour of old pictures.
2) Black & White Mode [B/W]
   - It records an image in black and white.

To Select a Desired Digital Effect

Set [VCR FUNCTIONS] >> [DIGITAL EFFECT] >> [EFFECT1] or [EFFECT2] >> a desired Digital Effect.

To Cancel the Digital Effect

Set [VCR FUNCTIONS] >> [DIGITAL EFFECT] >> [EFFECT1] or [EFFECT2] >> [OFF].

- If the Movie Camera is turned off, the [EFFECT2] settings are cancelled.

■Playback Digital Zoom Function

The centre of the image is enlarged to approximately 2 times during playback.

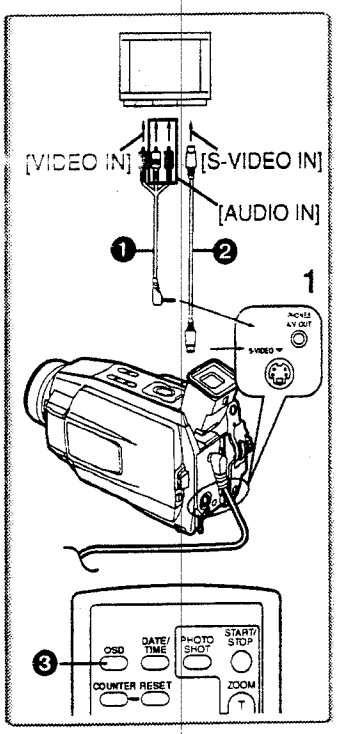
1 Set [VCR FUNCTIONS] >> [DIGITAL EFFECT] >> [D.ZOOM] >> [ON].

To Cancel the Playback Digital Zoom Function

Set [D.ZOOM] on the [DIGITAL EFFECT] Sub-Menu to [OFF].

- If you turn off the Movie Camera power or if you switch from VCR Mode to Camera Mode, Playback Digital Zoom Function is automatically cancelled.

- For other notes concerning this item, see page 41.



Playing Back on Your TV

By connecting your Movie Camera with your TV, the recorded scenes can be viewed on your TV screen.

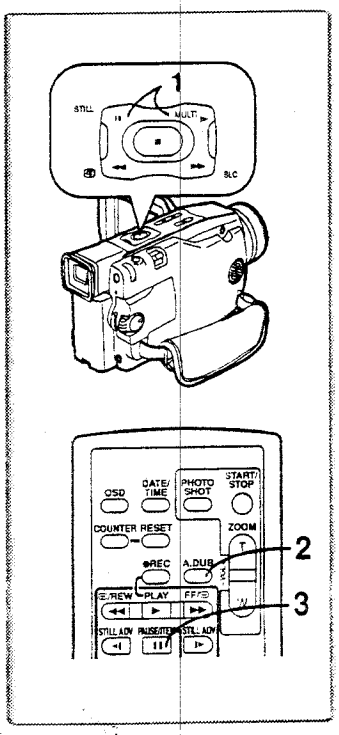
- Before connecting them, turn off the power of both the Movie Camera and TV.

1 Connect the [A/V OUT] Socket of the Movie Camera and the Video and Audio Input Sockets of the TV.

- Using the AV Cable ❶, make a connection with the TV. If the TV has an S-Video Socket, connect the S-Video Cable ❷ (not supplied), too.

To Make the Indications Appear on the TV Screen

Press the [OSD] Button ❸ on the Remote Controller.



Audio Dubbing

You can add music or narration to the recorded Cassette.

- If the tape recorded in the [16bit] Mode is dubbed with the Audio Dubbing function, the original sound is erased. (If you wish to preserve the original sound, use the [12bit] Mode when recording.)
- Audio Dubbing cannot be performed on a recording done in LP Mode. (➔ 19)

1 Switch the Movie Camera over to the Still Playback Mode where you want to add new sound.

2 Press the [A.DUB] Button on the Remote Controller.

3 To start Audio Dubbing, press the [❚❚] Button on the Remote Controller.

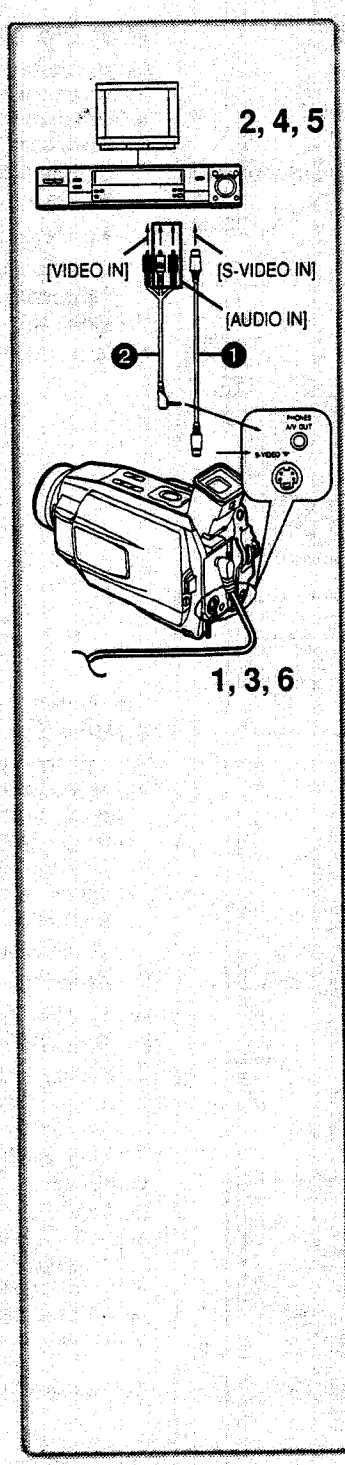
To Cancel Audio Dubbing

Press the [❚❚] Button on the Remote Controller.
The Movie Camera is in the Still Playback Mode again.

To Play Back the Sound Recorded by 12bit Audio Dubbing

Set [VCR FUNCTIONS] >> [PLAYBACK FUNCTIONS] >> [12bit AUDIO] >> [ST2] or [MIX].
ST1: It plays back only the original sound.
ST2: It plays back only the sound added by Audio Dubbing.
MIX: It plays back both the original sound and the sound added by Audio Dubbing simultaneously.

- For other notes concerning this item, see page 41.



Copying on an S-VHS (or a VHS) Cassette

(Dubbing)

After connecting the Movie Camera and the VCR as illustrated at left, start the following procedures.

- Be sure to press the [OSD] Button (➔ 8) on the Remote Controller prior to copying so that no indications are visible. Otherwise, the displayed tape counter and function indications are also copied.

Movie Camera:

1 Insert the recorded Cassette.

VCR:

2 Insert an unrecorded Cassette with an erasure prevention tab.

- If various setups (such as external input, tape speed, etc.) are required, please refer to the operating instructions of your VCR.

Movie Camera:

3 Press the [▶] Button to start playback.

VCR:

4 Start recording.

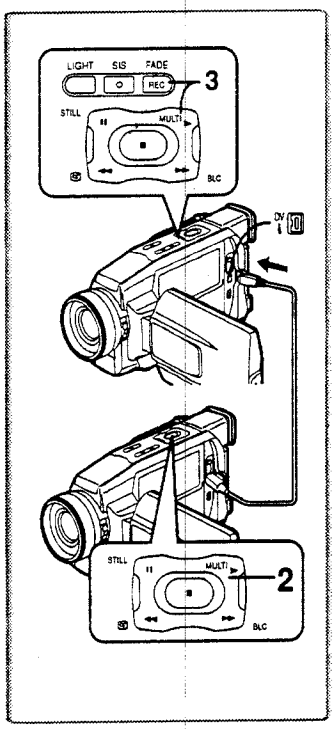
5 Press the Pause or Stop Button to stop recording.

Movie Camera:

6 Press the [■] Button to stop playback.

❶ S-Video Cable (not supplied)

❷ AV Cable



Using the DV Cable for Recording

(Digital Dubbing)

By connecting this Movie Camera with other digital video equipment that has a DV Input/Output Terminal (i.LINK) using a DV Cable VW-CD1E (optional) ❶, dubbing can be done in the digital format.

- Only the NV-DS30 can be used as a Recorder.

[Player/Recorder]

1 Insert the Cassette and set to the VCR Mode.

[Player]

2 Press the [▶] Button to start playback.

[Recorder]

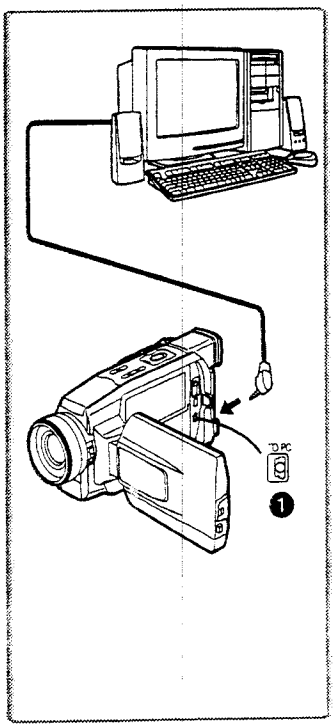
3 While pressing the [REC] Button, press the [▶] Button.

- Recording starts.

To Stop Dubbing

Press the [❚❚] Button or the [■] Button.

- For other notes concerning this item, see page 42.



Personal Computer Connection Kit

Using the optional Personal Computer Connection Kit, you can import still pictures into your personal computer.

- Use the Digital Still Picture Terminal [TO PC] ❶ when using the Personal Computer Connection Kit.
- When recording, be careful not to cut off the Time Code from the start of the tape.

- For more details on the operating environment, connections, and procedures, please refer to Personal Computer Connection Kit's operating instructions.

Others

Indications

Various functions and the Movie Camera status are shown on the screen.

- Some Indications may not be displayed according to the model.

:	Remaining Battery Power
	• When the battery power becomes low, the Indication changes. When the battery is discharged completely, the (Indication flashes.
:	(When you are using the AC Adaptor, the [ ] Indication may appear, however, this is not a malfunction.)
R0:45:	Remaining Tape Time
	• Remaining tape time is indicated in minutes. (When it reaches less than 3 minutes, the indication starts flashing.)
CINEMA:	Cinema Mode (➜ 23)
D.ZOOM:	Digital Zoom (➜ 21)
P-IN-P:	Picture in Picture Mode (➜ 28)
WIPE:	Wipe Mode (➜ 28)
MIX:	Mix Mode (➜ 28)
STROBE:	Strobe Mode (➜ 28)
GAINUP:	Gain-up Mode (➜ 28)
TRACER:	Trailing Effect Mode (➜ 28)
MOSAIC:	Mosaic Mode (➜ 28)
MIRROR:	Mirror Mode (➜ 28)
SLIM:	Slim Mode (➜ 28)
STRETCH:	Stretch Mode (➜ 28)
SEPIA:	Sepia Mode (➜ 34)
B/W:	Black & White Mode (➜ 34)
ZOOM:	Playback Digital Zoom (➜ 34)
SP:	Standard Mode (Recording Speed Mode) (➜ 19)
LP:	Long Play Mode (Recording Speed Mode) (➜ 19)
INDEX:	Index signal recording (➜ 33)
S 1:	Search Number (➜ 33)
5×:	Zoom Magnification Indication (➜ 21)
AUTO:	Automatic Mode (➜ 18)
MNL:	Manual Mode (➜ 25, 26, 27)
:	Image Stabilizer (➜ 22)
12 bit, 16 bit:	Audio Recording Mode (➜ 19)
MF:	Manual Focus (➜ 27)
:	Back Light Mode (➜ 23)
:	Sports Mode (Programme AE) (➜ 24)
:	Portrait Mode (Programme AE) (➜ 24)
:	Low Light Mode (Programme AE) (➜ 24)
:	Spotlight Mode (Programme AE) (➜ 24)
:	Surf & Snow Mode (Programme AE) (➜ 24)
REC:	Recording (➜ 18)
PAUSE:	Recording Pause (➜ 18)
▷:	Playback (➜ 30)
❚❚:	Still Playback (➜ 32)
▷▷:	Fast-forward/Cue Playback (➜ 31)
◁◁:	Rewind/Review Playback (➜ 30)
◁❚, ❚▷:	Slow Motion Playback (➜ 31)
◁❚❚, ❚❚▷:	Still Advance Playback (➜ 32)
⏮, ⏭:	Index Search (➜ 33)
CHK:	Recording Check (➜ 18)
A.DUB ▷:	Audio Dubbing (➜ 35)
A.DUB ❚❚:	Audio Dubbing Pause (➜ 35)
PHOTO:	Photoshot Mode Recording (➜ 20)
BLANK:	Blank Search (➜ 32)
2× ▷▷:	Variable Speed Search (➜ 31)
1/500:	When you adjust shutter speed manually, this indication appears. (➜ 26)
F2.4:	When you adjust the F Number manually, this indication appears. (➜ 27)
AWB:	Automatic White Balance Mode (➜ 25)
:	White Balance setting Mode (➜ 25)
:	Outdoor Mode (➜ 25)
:	Indoor Mode (recording under incandescent lamp) (➜ 25)
Z.MIC:	Zoom Microphone (➜ 21)
WIND CUT:	Wind Noise Reduction (➜ 24)
P:	Progressive Photoshot Mode (➜ 20)
0LUX:	0 Lux Night View Mode (➜ 23)
VOLUME:	Volume adjustment (➜ 30)
15:30:45:	Date/Time Indication (➜ 39)

■ To Change the Counter Display Mode

By changing [C.DISPLAY] on the [DISPLAY SETUP] Sub-Menu, you can change the Counter Display Mode to Tape Counter Indication [COUNTER] (0:00.00), Memory Counter Indication [MEMORY] (M0:00.00), and Time Code Indication [TIMECODE] (0h00m00s00f). (➜ 14) By repeatedly pressing the [COUNTER] Button on the Remote Controller, you can change the Counter Display Mode.

To Display Date/Time Indication

To display Date/Time Indication, set the appropriate Date/Time in [DATE/TIME] on the [DISPLAY SETUP] Sub-Menu. (➔ 14)
You can also press the [DATE/TIME] Button of the Remote Controller repeatedly to display or change the Date/Time Indication.

To Change the Display Mode

By changing [DISPLAY] on the [DISPLAY SETUP] Sub-Menu, you can change the Display Mode to All Function Display [ALL], Partial Display [PARTIAL], and Minimum Display [OFF].

Warning/Alarm Indications

If any one of the following indications lights up or flashes, please check the condition of the Movie Camera.

- Some Indications may not be displayed according to the model.

:	Condensation has occurred. (➔ 43)
:	The accidental erasure prevention slider on the inserted Cassette is open (that is, set to [SAVE]). You are about to do audio dubbing on the unrecorded (blank) portion of the tape. No Cassette is inserted. (➔ 12)
:	The Battery is low. Recharge it. (➔ 10)
:	The built-in battery is discharged. (➔ 17)
:	The video heads are dirty. (➔ 43)
END:	The tape came to end during recording.
REMOTE:	Wrong Remote Controller Mode has been selected. (➔ 39)
UNPLAYABLE TAPE:	You are attempting to play back a tape section that has been recorded with a different TV system.
UNABLE TO A. DUB:	Because the original recording was done in LP Mode, audio dubbing cannot be performed.
INCOMPATIBLE TAPE:	This Cassette is incompatible.
EJECT TAPE:	Mechanism irregular is detected. Eject the Cassette. This may solve the problem.
COPY INHIBITED:	Because the medium is protected by a copy guard, images cannot be recorded correctly.

Notes and Hints

Selecting Remote Controller Modes

When 2 Movie Cameras are used simultaneously, they can be operated individually by selecting different Remote Controller Modes.

- If the Remote Controller Mode of the Movie Camera and that of the Remote Controller do not match, [REMOTE] Indication is displayed.

Setup on the Movie Camera:
Set [REMOTE] on the [OTHER FUNCTIONS] Sub-Menu to the desired Remote Controller Mode. (➔ 14)
Setup on the Remote Controller:
[VCR1]:Press the [▮▸] Button and [■] Button simultaneously.❶
[VCR2]:Press the [◂▮] Button and [■] Button simultaneously.❷

- When the battery in the Remote Controller is replaced, the mode is automatically reset to [VCR1] Mode.

Concerning the Power Supply

- When the Movie Camera is used for a long time, the Camera body becomes warm, but this is not a malfunction.
- If the [CHARGE] Lamp does not light up although the Battery is attached to AC Adaptor, detach the Battery and reattach it.
- Battery CGP-D110 and CGP-D105 cannot be charged with this AC Adaptor.

Inserting/Removing the Cassette

- If a new Cassette is inserted, rewind to the beginning of the tape before starting recording.
- When inserting the cassette, make sure it faces in the right direction and then push it in until it stops.

Alarm Sounds

When [BEEP SOUND] on the [OTHER FUNCTIONS] Sub-Menu on the [CAMERA FUNCTIONS] Main-Menu is set to [ON], confirmation/alarm beeps are issued as follows.

1 Beep
- When you start recording
- When you switch the Power Switch from [OFF] to other mode

2 Beeps
- When you pause recording

10 Beeps
- If you perform a wrong operation before or during recording

Recording

- Before turning on the power, remove the Lens Cap. If the Lens Cap is still attached when the power is turned on, Automatic White Balance Adjustment (➔ 47) may not function correctly.

Recording Check

- For Recording Check, the recording speed mode (SP/LP) must be the same as the mode used for the recording. If different, playback images will be distorted.

Photoshot

- Photoshot Recording results in slightly inferior image quality.

Progressive Photoshot Function

- The still pictures are recorded at a slightly rewound point from where you press the [PHOTO SHOT] Button.
- When you change to the Still Picture Mode, you will hear a click. This is the sound of the iris closing and not an indication of malfunction.
- If you record still pictures in Progressive Photoshot Mode when your Movie Camera is set to Programme AE (➔ 24), the brightness of the images may change.

About [PROGRESSIVE] Setup

- When the [P] Indication is displayed, you can use the Progressive Photoshot Function.

When [PROGRESSIVE] is [ON]:

You can use the Progressive Photoshot Function at any time. In this case, however, the following functions are disabled.

- Digital Effect Modes in [EFFECT] (➔ 28)
- Digital Zoom [D.ZOOM] (➔ 21)
- 1/750 s or faster shutter speed (➔ 26)

Zoom In/Out Functions

- When you are zooming on a faraway subject, a sharper focus is achieved if the recording subject is 1.7 metres or more away from the Movie Camera.

Image Stabilizer Function

- The Image Stabilizer Function does not operate in a dimly lit place. In this case, the [ ] Indication lights up.
- Under fluorescent lighting, image brightness may change or colours may not look natural.
- After-images may appear.
- When a tripod is used, it is recommended that you turn the Image Stabilizer off.

Cinema Function

- If you play back tape recorded in Cinema Mode on a wide-screen (16:9) format TV, playback size is automatically adjusted to fit the TV screen format. Please refer to the TV's operating instructions for details.
- When images are displayed on a TV screen, the Date/Time Indication may be erased in some cases.

0 Lux Night View Function

- The 0 Lux Night View Function should not be usec in brightly-lit places, and the Movie Camera shoulc not be directed toward the sun. Otherwise, irreparable damage may occur.
- Scenes taken by the 0 Lux Night View Function are played back in black and white.
- When recording with the 0 Lux Night View Function, operating the shutter speed, iris and white balance is not possible.
- While the 0 Lux Night View Function is operating, you cannot use any of the Programme AE Modes.
- When the 0 Lux Night View Function is in use, the subject should be within 3 metres of the Movie Camera.
- When the automatic focusing is not precise, adjus the focus manually. (➔ 27) (In this case, the Manual Focus Mode is activated when the [FOCUS] Button is pressed even then the Movie Camera is in the Full Auto Mode.)

Programme AE

- If any of the Programme AE Modes is selected, you cannot adjust the shutter speed (➔ 26) or iris (➔ 27).
- You cannot use Sports Mode, Portrait Mode or Low-Light Mode with Gain-up Mode [GAINUP].

Sports Mode

- During normal playback, the image movemen may not look smooth.
- Because the colour and brightness of the playback image may change, avoid recording under fluorescent light, mercury light, or sodium light.
- If you record a subject illuminated with strong light or a highly reflective subject, vertical lines of light may appear.
- If the light is insufficient, the [ ] Indication flashes.
- If this mode is used for indoor recording, playback images may flicker.

Sports Mode/Portrait Mode

- If you record a still picture in Progressive Photoshot Mode, the brightness and hue of the recorded still picture may become unstable.

Low Light Mode

- Extremely dark scenes may not be able to be made brighter to a satisfactory degree.

Spotlight Mode

- With this mode, recorded images may turn ou to be extremely dark.

- If the recording subject is extremely bright, its recorded image may turn out to be whitish.

Surf & Snow Mode

- If the recording subject is extremely bright, its recorded image may turn out to be whitish.

White Balance

- You cannot change White Balance if you set [EFFECT] of [DIGITAL EFFECT] Sub-Menu on the [CAMERA FUNCTIONS] Main-Menu to [GAINUP].

In the following cases, the [ ] Indication flashes:

- The flashing indicates that the previously adjusted White Balance setting is still kept. This setting will be kept until White Balance is adjusted again.
- You may not be able to achieve correct White Balance Adjustment manually under weak illumination.

Manual Shutter Speed Adjustment

- You may see vertical lines of light in the playback image of a brightly shining subject or highly reflective subject.
- During normal playback, movement in the images may not look smooth.
- Because the colour and brightness of the playback image may become unstable, avoid recording under fluorescent light, mercury light, or sodium light.
- If you are using either Gain-up Mode (➔ **28**) or Programme AE Mode (➔ **24**), you cannot adjust the shutter speed. If the shutter speed was adjusted manually, this setting will be cancelled.

Manual Iris Adjustment

- Depending on zoom magnification, there are iris values that will not be displayed.
- If you are using Programme AE Mode (➔ **24**), you cannot adjust the iris. If the iris is adjusted manually, this setting will be cancelled.
- If you attempt to adjust the Shutter Speed after setting the Iris, the value set for the Iris will be cancelled.

Digital Effect Functions

It is as follows when [GAINUP] is selected.

- Manual Focus Mode
- The shutter speed and White Balance cannot be operated.
- The Sports Mode [ ], the Portrait Mode [ ] and Low Light Mode [ ] are cancelled.
- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON], the digital modes of [EFFECT] on the [DIGITAL EFFECT] Sub-Menu cannot be used. (➔ **40**)

Wipe Mode and Mix Mode

If either one of the following operations is carried out, stored images will be erased, and Wipe and Mix Functions cannot be used.

- Press the [STILL] Button

Picture-in-Picture Mode

- If the Movie Camera is turned off, the smaller picture disappears.
- The position of a small picture is fixed at the bottom right of the screen.

Playing Back

Listening to Playback Sound through Headphones

When you wish to listen to playback sound through headphones, connect the headphones to the [PHONES] Socket (➔ **7**) on the Movie Camera. In this case, no sound (including a warning sound and shutter sound) will be reproduced through the built-in speaker of the Movie Camera.

Multi-Picture Mode

- The quality of Multi images deteriorates slightly.
- Playback Multi-Mode screens cannot be output through the DV Terminal (➔ **37**) or Digital Still Picture Terminal (➔ **6**).
- If there is input from DV Terminal, a multi screen cannot be created.

Index Search Functions

- Index Search may not be possible at the beginning of tape.
- Because Photoshot Index Signals are not recorded on still pictures recorded in Continuous Photoshot Mode, the Photoshot Index Search Function cannot be used for these still pictures.
- Scene Index Search may not function properly if the interval between 2 scene index signals is shorter than 1 minute.

Playback Digital Effect Functions

- When [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu is set to [TRACER], the digital modes of [EFFECT2] cannot be used.
- It is not possible to use [SEPIA] or [B/W] of [EFFECT2] together with Playback Digital Zoom Function.
- Signals of images to which digital effects are added during playback cannot be output from the DV Terminal (➔ **6**) or Digital Still Picture Terminal (➔ **37**).
- Even if Playback Digital Zoom Functions are being used, images that are output from the DV Terminal (➔ **6**) or Digital Still Picture Terminal (➔ **37**) are not enlarged.
- As you enlarge an image, the quality of image suffers.

Audio Dubbing

- The blank section of a tape cannot be dubbed.

- Sounds sent through the DV Terminal cannot be dubbed.
- If a tape has a non-recorded portion when the tape is dubbed, images and sounds may be disturbed when this portion of the tape is played back.
- If you set the tape counter back to 0 at the position where you want to stop Audio Dubbing so as to make it possible to use the Memory Stop Function (➔ 47), Audio Dubbing is terminated automatically when the tape reaches this position.
- In the case of importing data recorded with Audio Dubbing to a PC using the PC's software programme, only the original sound (ST1) may be imported, depending on the software programme.

■Using the DV Cable for Recording (Digital Dubbing)

- Regardless of the setting, digital dubbing is carried out automatically in the same audio recording mode as that of the Cassette on the playback-side. (NV-DS30 only)
- The images on the monitor of the recording side may be disturbed, but it does not affect the recorded images.
- Even if Playback Digital Effects or Playback Digital Zoom Function have been used, these effects are not output from the DV Terminal.
- Even if you use device equipped with DV Terminals (such as i.LINK), you may not be able to perform Digital Dubbing in some cases.

Cautions for Use

■After Use

1 **Take out the Cassette.** (➔ 12)
2 **Set the Power Switch to [OFF].**
3 **Detach the power supply and retract the Viewfinder or the LCD Monitor.** (➔ 10, 13)
4 **To protect the Lens, attach the supplied Lens Cap.**

■Cautions for Use

When you use your Movie Camera in a rainy or snowy day or on a beach, make sure that no water enters inside the Movie Camera.

- Water may cause the Movie Camera or Cassette to malfunction. (Irreparable failure may occur.)
- If sea water splashes onto the Movie Camera, wet a soft cloth with tap water, wring it well, and use it to wipe the camera body carefully. Then, wipe it again thoroughly with a soft dry cloth.

Keep the Movie Camera away from magnetized equipment (such as a microwave oven, TV, video game equipment, etc.).

- If you use the Movie Camera on or near a TV, images or sounds may be disturbed due to electromagnetic wave radiation.
- Do not use near a cell phone because doing so may cause noise to adversely affect the picture and sound.
- By strong magnetic fields created by speakers or large motors, recording on the tape may be damaged, or images may be distorted.
- Electromagnetic wave radiation generated by a microprocessor may adversely affect the Movie Camera, causing the disturbance of images and sounds.
- If the Movie Camera is affected by magnetically charged equipment and does not function properly, turn off the Movie Camera power and detach the Battery or AC Adaptor and then connect the Battery or AC Adaptor again. Thereafter, turn on the Movie Camera power.

Do not use your Movie Camera near radio transmitters or high-voltage lines.

- If you record pictures near radio transmitters or high-voltage lines, recorded images or sounds may be adversely affected.

Do not use this Movie Camera for surveillance purpose or other business use.

- If you use the Movie Camera for a long period of time, the internal temperature increases and, consequently, this may cause malfunction.
- This Movie Camera is not intended for business use.

When you use your Movie Camera on a beach or similar place, do not let sand or fine dust get into the Movie Camera.

- Sand or dust may damage the Movie Camera or Cassette. (Care should be taken when inserting and removing the Cassette.)

Do not spray insecticides or volatile chemicals onto the Movie Camera.

- If the Movie Camera is sprayed with such chemicals, the camera body may be deformed and the surface finish may peel off.
- Do not keep rubber or plastic product in contact with the Movie Camera for a long period of time.

Do not use benzine, thinner or alcohol for cleaning the Movie Camera.

- The camera body may be deformed and the surface finish may peel off.
- Before cleaning, detach the Battery or pull out the AC Mains Lead from the AC mains socket.
- Wipe the Movie Camera with a soft dry cloth. To remove stubborn stains, wipe with a cloth that is soaked in a detergent diluted with water and afterward finish wiping with a dry cloth.

- For storing or transporting the Movie Camera, place it in a bag or case lined with soft pads so as to prevent the coating on the camera body from being worn.

After use, be sure to take the Cassette out and detach the Battery from the Movie Camera or pull out the AC Mains Lead from AC mains socket.

- If the Cassette is left in the Movie Camera, the tape sags and deteriorates.
- If the Battery is left on the Movie Camera for a long time, the voltage drops excessively, and the Battery will not function even after it is recharged.

About AC Adaptor

- If the temperature of the Battery is extremely high or extremely low, the [CHARGE] Lamp may continue flashing, and the Battery may not be charged. After the temperature of the Battery has decreased or increased sufficiently, charging starts automatically. If the [CHARGE] Lamp continues to flash even after the Battery temperature has decreased or increased sufficiently, the Battery or AC Adaptor may be faulty. In this case, please contact a dealer.
- If the Battery is warm, charging takes a longer time than normal.
- If you use the AC Adaptor near a radio, radio reception may be disturbed. Keep the AC Adaptor 1 metre or more away from radio.
- When the AC Adaptor is in use, it may generate whirring sounds. However, this is normal.
- After use, be sure to pull out the AC Mains Lead from the AC mains socket. (If they are left connected, a minute amount of current is consumed.)
- Keep the electrodes of the AC Adaptor and Battery always clean.

Condensation

If the Condensation Indication flashes after the Movie Camera is turned on, condensation has formed inside the Movie Camera. In this case, the Movie Camera power is turned off automatically after about 1 minute.

Follow the steps below:

1 Take out the Cassette.

- None of the other functions operate. Depending on the amount of condensation, removing the Cassette may even become difficult. If this happens, wait for 2 to 3 hours before taking the Cassette out.

2 Open the Cassette Compartment Cover and wait for 2 to 3 hours.

- The number of hours to wait depends on the amount of condensation and ambient temperature.

3 2 to 3 hours later, turn on the Movie Camera power and check to see if the Condensation Indication is displayed.

- Even if the Condensation Indication is not displayed, as a precaution, please wait for another hour before using the Movie Camera.

Watch for Condensation even before the Condensation Indication is displayed.

- Because condensation takes place gradually, the Condensation Indication may not be displayed during the first 10 to 15 minutes of condensation formation inside the Movie Camera.
- In extremely cold places, condensation may freeze and form frost. In this case, the frost melts first, thus forming condensation, and then it takes another 2 to 3 hours to eliminate the condensation.

When the Lens is Fogged:

Set the Power Switch to [OFF] and leave the Movie Camera in this condition for about 1 hour. When the lens temperature becomes close to the ambient temperature, the fog disappears naturally.

Video Head Clogging and Care

If the heads (the parts that make contact with tape) are dirty, mosaic-pattern noise may appear on the playback image, or the screen as a whole becomes black. If the heads are extremely dirty, recording performance deteriorates, and, in the worst case, the Movie Camera cannot record at all.

Causes of Dirty Heads

- Large quantity of dust in the air
- High-temperature and high-humidity environment
- Damaged tape
- Long operating hours

Using Mini-DV Format Digital Video Head Cleaner

1 Insert the Head Cleaner into the Movie Camera in the same manner as a Video Cassette.

2 Press the [▶] Button, and approximately 20 seconds later, press the [■] Button. (Do not rewind the tape.)

3 Take out the Head Cleaner. Insert a Video Cassette and start recording. Then, play the tape back to check the recorded image.

4 If the image is not still clear, repeat Steps 1 to 3. (Do not use the Head Cleaner for 3 times or more consecutively.)

Notes:

- Do not rewind every time you use the Head Cleaner. Rewind only when the tape reaches the end, and then use it again from the beginning in the same manner as before.
- If the heads become dirty soon after cleaning, the tape may be damaged. In this case, immediately stop using that Cassette.
- Do not clean the heads excessively. (Excessive cleaning may cause excessive wear of the heads. If the heads are worn, images cannot be played back even after the heads are cleaned.)
- If the dirty heads cannot be cleaned with the Head Cleaner, the Movie Camera needs to be cleaned at a service centre. Please consult a dealer.
- Video Head Cleaners can be purchased from service centres.
- Head cleaning due to dirty heads is not considered a malfunction of the product. It is not covered by the warranty.

Periodical Check-up

To maintain the highest image quality, we recommend replacement of worn parts, such as heads, etc., after approximately 1000 hours of use. (This, however, depends on operating conditions, such as temperature, humidity, dust, etc.)

■Optimal Use of the Battery

Battery Characteristics

This Battery is a rechargeable lithium ion battery. Its ability to generate power is based upon the chemical reaction that takes place inside it. This reaction is susceptible to the surrounding temperature and humidity, and, if the temperature is too high or too low, the operating time of the Battery becomes shorter. If the Battery is used in an extremely cold environment, the Battery may operate only for about 5 minutes. If the Battery becomes extremely hot, a protective function may operate, and the Battery may become unusable for a while.

Be Sure to Detach the Battery after Use

Be sure to detach the Battery from the Movie Camera. (If it is left attached to the Movie Camera, a minute amount of current is consumed even when the Movie Camera power is off.) If the Battery is left attached to the Movie Camera for a long time, over discharge takes place. The Battery may become unusable after it is charged.

Disposing of an Unusable Battery

- The Battery has a limited life.
- Do not throw the Battery into fire because it may cause an explosion.

Always Keep the Terminals of the Battery Clean

Prevent the terminals from getting clogged with dirt, dust, or other substances.

If you drop the Battery accidentally, check to see if the Battery body and terminals are deformed. Attaching a deformed Battery to the Movie Camera or AC Adaptor may damage the Movie Camera or AC Adaptor.

■Cautions for Storage

Before storing the Movie Camera, take the Cassette out and detach the Battery.

Store all the components in a dry place with a relatively stable temperature.
(Recommended Temperature:15 to 25°C, Recommended Humidity:40 to 60%)

Movie Camera

- Wrap it with a soft cloth to prevent dust from getting into the Camera.
- Do not leave the Movie Camera in places that expose it to high temperature.

Battery

- Extremely high temperatures or low temperatures will shorten the life of the Battery.
- If the Battery is kept in smoky or dusty places, the terminal may rust and cause malfunctions.
- **Do not allow the Battery terminals to come in contact with metal objects (such as necklaces, hairpins, etc.). This can result in a short circuit or heat generation and, if you touch the Battery in this condition, you may be badly burned.**
- Store the Battery in a completely discharged state. To store the Battery for a long period of time, we recommend you charge it once every year and store it again after you completely use up the charged capacity.

Cassette

- Before storing it, rewind the tape to the beginning. If the Cassette is left for more than 6 months with the tape stopped midway, the tape sags (although it depends on the storage condition). Be sure to rewind to the beginning.
- Store the Cassette in its case. Dust, direct sunlight (ultraviolet rays), or humidity may damage the tape. Dust contains hard mineral particles, and dusty Cassettes damage the heads of the Movie Camera and other components. Develop a habit of returning the Cassette back to its case.
- Once every half year, wind the tape to the end and then rewind it to the beginning. If the Cassette is left for 1 year or longer without winding or rewinding, temperature and humidity changes may cause the Cassette to deform due to swelling, shrinking, and so forth. The wound tape may stick to itself.
- Do not place a Cassette near highly magnetic substances or equipment.
- The surface of tape is covered with extremely minute magnetic particles, upon which signals are recorded. Magnetic necklaces, toys, etc., have

magnetic force that is stronger than you may normally expect, and they may erase the contents of a recording or may cause noise in images and sounds.

■ LCD Monitor/Viewfinder/Lens

LCD Monitor

- In a place with drastic temperature changes, condensation may form on the LCD Monitor. Wipe it with soft dry cloth.
- If your Movie Camera is extremely cold when you turn its power on, the image on the LCD Monitor is slightly darker than usual at first. However, as the internal temperature increases, it goes back to the normal brightness.

Extremely high precision technology is employed to produce the LCD Monitor screen featuring a total of approximately 110,000 pixels. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

Viewfinder

- Do not direct the Viewfinder or Lens to the sun. Internal components may be seriously damaged.
- When the Movie Camera is used with a large capacity Battery (CGP-D28S/CGP-D320; optional) attached to it, it is not practical to look in the Viewfinder from behind the Battery. In this case, lift up the Viewfinder to an easy-to-see angle.

Extremely high precision technology is employed to produce the Viewfinder screen featuring a total of approximately 113,000 pixels. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

Lens

- If you push the [W/T] Lever toward [W] during recording with the optional filter or conversion lens attached to the Movie Camera, 4 corners of the image may become dark (vignetting). For details, please refer to the operating instructions of your accessories.

■ Built-in DC Light

The temperature of the DC Light may become very hot, therefore, be careful not to touch the grass part of the front of the Movie Camera, when using the DC Light for a long time.

Before Requesting Repair (Problems and Solutions)

Power

1: The Movie Camera power cannot be turned on.

1: Is the power source connected correctly? (➔ 10)

2: The Movie Camera power is turned off automatically.

2: If you leave the Movie Camera in Recording Pause Mode for more than 6 minutes, the power is turned off automatically to protect the tape and to save the Battery power. (➔ 18)

3: The Movie Camera power does not stay on long enough.

3-1: Is the Battery low? Charge the Battery or attach a fully charged Battery. (➔ 10)

3-2: Has condensation occurred? Wait until the Condensation Indication disappears. (➔ 43)

Battery

1: Battery runs down quickly.

1-1: Is the Battery fully charged? Charge it with the AC Adaptor. (➔ 10)

1-2: Are you using the Battery in an extremely cold place? In cold places, the operating time of the Battery becomes shorter. (➔ 44)

1-3: Has the Battery worn-out? If the operating time is still too short even after the Battery is fully charged, the Battery has worn out.

2: The Battery cannot be charged.

2: If the DC Input Lead is connected to the AC Adaptor, charging cannot be performed. Disconnect the DC Input Lead.

Normal Recording

1: Recording does not start although power is supplied to the Movie Camera and the Cassette is correctly inserted.

1-1: Is the accidental erasure prevention slider on the Cassette open? If it is open (set to [SAVE]), recording cannot be performed. (➔ 12)

1-2: Is the tape wound to the end? Insert a new Cassette. (➔ 12)

1-3: Is the Power Switch set to [CAMERA]? If it is set to the other position, the recording function cannot be used. (➔ 18)

1-4: Has condensation occurred? Wait until the Condensation Indication disappears. (➔ 43)

Other Recording

1: Auto Focus Function does not work.

1-1: Is Manual Focus Mode selected? If Auto Focus Mode is selected, focus is automatically adjusted. (➔ 27)

1-2: There are some recording subjects and recording surroundings for which the Auto Focus Function does not operate correctly. In this case, use the Manual Focus Mode to adjust the focus. (➔ 47)

Editing

1: Audio dubbing cannot be performed.

1-1: Is the accidental erasure prevention slider on the Cassette open? If it is open (set to [SAVE]), recording cannot be performed. (➔ 12)

1-2: Are you attempting to edit a tape portion that was recorded in LP Mode? LP Mode does not allow audio dubbing to operate. (➔ 19)

Indications

1: The Time Code becomes inaccurate.

1: The Time Code Indication counter may not be constant in the reverse direction in Slow Motion Playback Mode, but this is not a malfunction.

2: The Remaining Tape Time Indication disappears.

2: When you record still pictures in Photoshot Mode, the Remaining Tape Time Indication may disappear temporarily. However, it reappears when recording normally.

3: The Remaining Tape Time Indication does not match the actual remaining tape time.

3-1: If scenes of less than 15 seconds are continuously recorded, the remaining tape time cannot be displayed correctly.

3-2: In some cases, the Remaining Tape Time Indication may show remaining tape time that is 2 to 3 minutes shorter than the actual remaining tape time.

Playback (Images)

1: Images cannot be played back even when the [▶] Button is pressed.

1: Is the Power Switch set to [VCR]? If it is set to the other position, the playback function cannot be used. (➔ 30)

2: Mosaic-pattern noise appears on images during Cue, Review or Slow Motion Playback.

2: This phenomenon is characteristic of digital video systems. It is not a malfunction.

3: Although the Movie Camera is correctly connected to a TV, playback images cannot be seen.

3: Have you selected "Video Input" on the TV? Please read the operating instructions of your TV and select the channel that matches the input sockets used for the connection.

4: Playback image is not clear.

4: Are the heads of the Movie Camera dirty? If the heads are dirty, playback image cannot be clear. (➔ 43)

Playback (Sound)

1: Sound is not played back from the built-in speaker of the Movie Camera or the headphones.

1: Is the volume too low? Push the [VOLUME] Lever to adjust the volume. (➔ 30)

2: Different sounds are reproduced at the same time.

2: [12bit AUDIO] on the [PLAYBACK FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Main-Menu has been set to [MIX]. As a result, the original sound and sound that was recorded by audio dubbing are played back together. It is possible to reproduce the sounds separately. (➔ 35)

3: The original sound was erased when audio dubbing was performed.

3: If you perform audio dubbing on a recording done in [16bit] Mode, the original sound will be erased. If you wish to preserve the original sound, be sure to select [12bit] Mode at the time of recording.

4: Sounds cannot be played back.

4-1: Although a Cassette with no audio dubbing is being played, is [12bit AUDIO] on the [PLAYBACK FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Main-Menu set to [ST2]? To play back a Cassette with no audio dubbing, [12bit AUDIO] must be set to [ST1]. (➔ 35)

4-2: Is the Variable Speed Search Function working? Press the [▶] Button to cancel the Variable Speed Search Function. (➔ 31)

Explanation of Terms

■ Digital Video System

In a digital video system, images and sounds are converted into digital signals and recorded on a tape. This complete digital recording is capable of recording and playback with minimal image and sound deterioration.

In addition, it automatically records data, such as Time Code and Date/Time, as digital signals.

Compatibility with S-VHS or VHS Cassettes

Because this Movie Camera employs a digital system for recording image and sound data, it is not compatible with conventional S-VHS or VHS video equipment that employs an analog recording system.

The size and shape of the Cassette are also different.

Compatibility with Output Signals

Because AV signal output from the AV signal output socket is analog (the same as conventional video systems), this Movie Camera can be connected with S-VHS or VHS video or a TV for playback.

■ Focus

Auto Focus Adjustment

The Auto Focus System automatically moves forward and backward the focusing lens inside the Movie Camera to bring the subject into focus so that the subject can be seen clearly.

However, the Auto Focus System does not function properly for the following subjects or under the following recording conditions.

Please use the Manual Focus Mode instead.

1) **Recording a subject whose one end is located closer to the Movie Camera and the other end farther away from it**
   - Because Auto Focus makes adjustments at the centre of an image, it may be impossible to focus on a subject that is located in both foreground and background.
2) **Recording a subject behind dirty or dusty glass**
   - Because the focus is on the dirty glass, the subject behind the glass will not be focused.
3) **Recording a subject in dark surroundings**
   - Because the light information that comes through the lens decreases considerably, the Movie Camera cannot focus correctly.
4) **Recording a subject that is surrounded by objects with glossy surfaces or by highly reflective objects**
   - Because the Movie Camera focuses on the objects with glossy surfaces or on highly reflective objects, the recording subject may become blurry.
5) **Recording a fast-moving subject**
   - Because the focus lens inside moves mechanically, it cannot keep up with the fast-moving subject.
6) **Recording a subject with little contrast**
   - Because the Movie Camera achieves focus based upon the vertical lines of an image, a subject with little contrast, such as a white wall, may become blurry.

■ White Balance Adjustment

Depending on the type of light source, the colours recorded by the Movie Camera may be affected. In some cases, images may be recorded with bluish or reddish hue. To minimize the effect of light on the subject's colour, what is called White Balance Adjustment becomes necessary.

White Balance Adjustment

White Balance Adjustment recognizes the colour of light and makes adjustment so that the white colour will become pure white.

Automatic White Balance Adjustment

This Movie Camera stores settings that are optimal for several kinds of general light sources. The Movie Camera determines the hue of light that it receives through the Lens and White Balance Sensor (**➔ 7**), thereby judging the recording condition, and selects the closest hue setting. This function is called Automatic White Balance Adjustment.

However, since white balance settings for only several kinds of light sources are stored, the Auto White Balance Function does not operate properly when recording occurs under light that is out of the range of the setup values.

■ Time Code

Time Code signals are data that indicate time measured in hours, minutes, seconds, and frames (25 frames per second). If this data is included in a recording, an address is assigned to each image on the tape.

- The Time Code is automatically recorded as a part of the sub-code at each recording.
- When a new (previously unrecorded) Cassette is inserted, the Time Code automatically starts from zero. If a recorded Cassette is inserted, the Time Code picks up from the point where the last scene was recorded. (In this case, when the Cassette is inserted, the zero display [0h00m00s00f] may appear, but the Time Code starts from the previous value.)
- The Time Code cannot be reset to zero.
- Unless the Time Code is continuously recorded from the beginning of a tape, accurate editing may not be possible. To ensure that the Time Code will be recorded with no breaks, we recommend the use of the Blank Search Function (**➔ 32**) before recording a new scene.

■ Memory Stop Function

The Memory Stop Function is useful for the following operations.

Rewinding or fast-forwarding a tape to a desired position

1 **Set [DISPLAY SETUP] >> [C.DISPLAY] >> [MEMORY].**
2 **Reset the Tape Counter to zero at the tape position from which you want to play it back later. (➔ 8, 15)**
3 **Start playback or recording.**

4 After playback or recording has finished:
Set the Power Switch to [VCR].

5 Rewind the tape.
- The tape automatically stops approximately at the position where the counter was set to zero.

Stopping editing automatically during audio dubbing

1 Set [DISPLAY SETUP] >> [C.DISPLAY] >> [MEMORY].

2 Reset the Tape Counter to zero at the position where you want to stop editing.

3 Play back the still picture where you want to start audio dubbing.

4 Start audio dubbing. (➔ 35)
- Audio dubbing automatically stops at the position where the counter was set to zero.

■ Owner ID

You can register your name and address in your Movie Camera to identify the owner.

1 Set [CAMERA FUNCTIONS] >> [OTHER FUNCTIONS] >> [OWNER ID SET] >> [ON].
- The Owner ID setup screen appears.

2 Turn the [PUSH] Dial to select [PIN NUMBER]/[NAME]/[POSTCODE] and press the [PUSH] Dial to enter the setup mode.

3 Turn the [PUSH] Dial to select characters and press the [PUSH] Dial to enter them.
- You can input 4 digits in [PIN NUMBER], up to 12 characters in [NAME], and up to 11 characters in [POSTCODE].

4 Push the [■] to exit the setup mode.
- By keep Pressing the [■] Button for approximately 5 seconds, you can verify the Owner ID easily.

To Check Owner ID

If Owner ID has already been set, carrying out Step1 above will display [INPUT PIN NUMBER] on the screen. Input the Pin Number you have already selected. If the number is not correct, the screen will not change. If the number is correct, the contents of the setup will be displayed. (By repeating Steps 2 to 4 above, you can change the contents.)

■ Demonstration Mode

If no operation takes place for approximately 10 minutes after the AC Adaptor was connected to the Movie Camera and the Power Switch was turned to [CAMERA] without inserting a Cassette, the Movie Camera is automatically set to Demonstration Mode for introducing its functions. If any button is pressed or operated, the Demonstration Mode is cancelled. The Demonstration Mode can be started by setting [DEMO MODE] on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu to [ON] and by exiting the Menu. To terminate the Demonstration Mode, insert a Cassette or set the [DEMO MODE] to [OFF].

Specifications

Digital Video Camera Information for your safety

Power Source:	DC 0.0/0.0 V
Power Consumption:	Recording 0.0 W (When using Viewfinder) 0.0 W (When using LCD Monitor)
Recording Format:	Mini DV (Consumer-use Digital Video SD Format)
Tape Used:	6.35 mm digital video tape
Recording/Playback Time:	SP: 80 min.; LP: 120 min. (with DVM80)
Video	
Recording System:	Digital Component
Television System:	CCIR: 625 lines, 50 fields PAL colour signal
Audio	
Recording System:	PCM Digital Recording 16 bit (48 kHz/2ch), 12 bit (32 kHz/4ch)
Image Sensor:	1/4-inch CCD Image Sensor
Lens:	Auto Iris, F1.8, Focal Length; 3.6–36 mm, Macro (Full Range AF)
Filter Diameter:	43 mm
Zoom:	10:1 Power Zoom
Monitor:	2.5-inch LCD
Viewfinder:	Electronic Viewfinder
Microphone:	Stereo
Speaker:	1 round speaker Ø 28 mm
Standard Illumination:	1,400 lx
Minimum Required Illumination:	1 lx (Digital Gain-up Mode)
Video Output Level:	1.0 Vp-p, 75 ohm
S-Video Output Level:	Y Output: 1.0 Vp-p, 75 ohm C Output: 0.286 Vp-p, 75 ohm
Audio Output Level (Line):	316 mV, 600 ohm
Mic Input:	Mic sensitivity –50 dB (0 dB=1 V/Pa, 1 kHz) (Stereo mini jack)
Digital Still Picture:	Digital Still Picture Output, Control Signal Input/Output (Transfer rate: max. 115 kbps)
Digital Interface:	**(NV-DS29)** DV Output Terminal (i.LINK, 4-pin) **(NV-DS30)** DV Input/Output Terminal (i.LINK, 4-pin)
Dimensions:	Approx. 00 (W)×00 (H)×000 (D) mm
Weight:	Approx. 000 g (without Battery and DV cassette) Approx. 000 g (with CGR-D08R and DVM60)
Operating Temperature:	0 °C—40 °C
Operating Humidity:	10%—80%

AC Adaptor Information for your safety

Power Source:	AC 100–240 V, 50/60 Hz
Power Consumption:	20 W
DC Output:	DC 7.9 V, 9 W (Movie Camera Operation) DC 8.4 V, 1.2 A (Battery Charging)
Dimensions:	70 (W)×45 (H)×116 (D) mm
Weight:	Approx. 165 g

Weight and dimensions are approximate values.
Specifications may change without prior notice.

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